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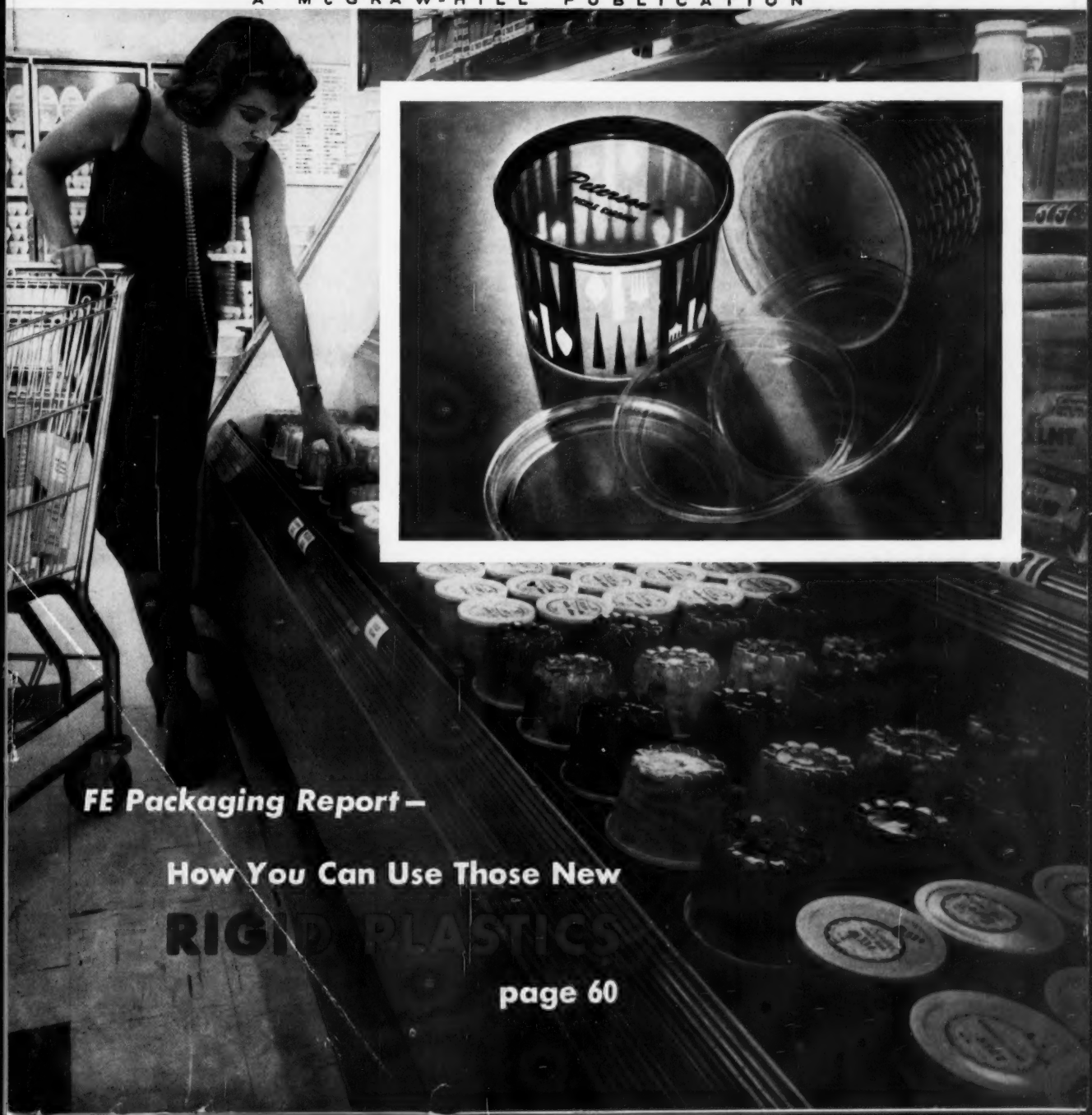
FEBRUARY 1960

$1.00

FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION



FE Packaging Report—

How You Can Use Those New

RIGID PLASTICS

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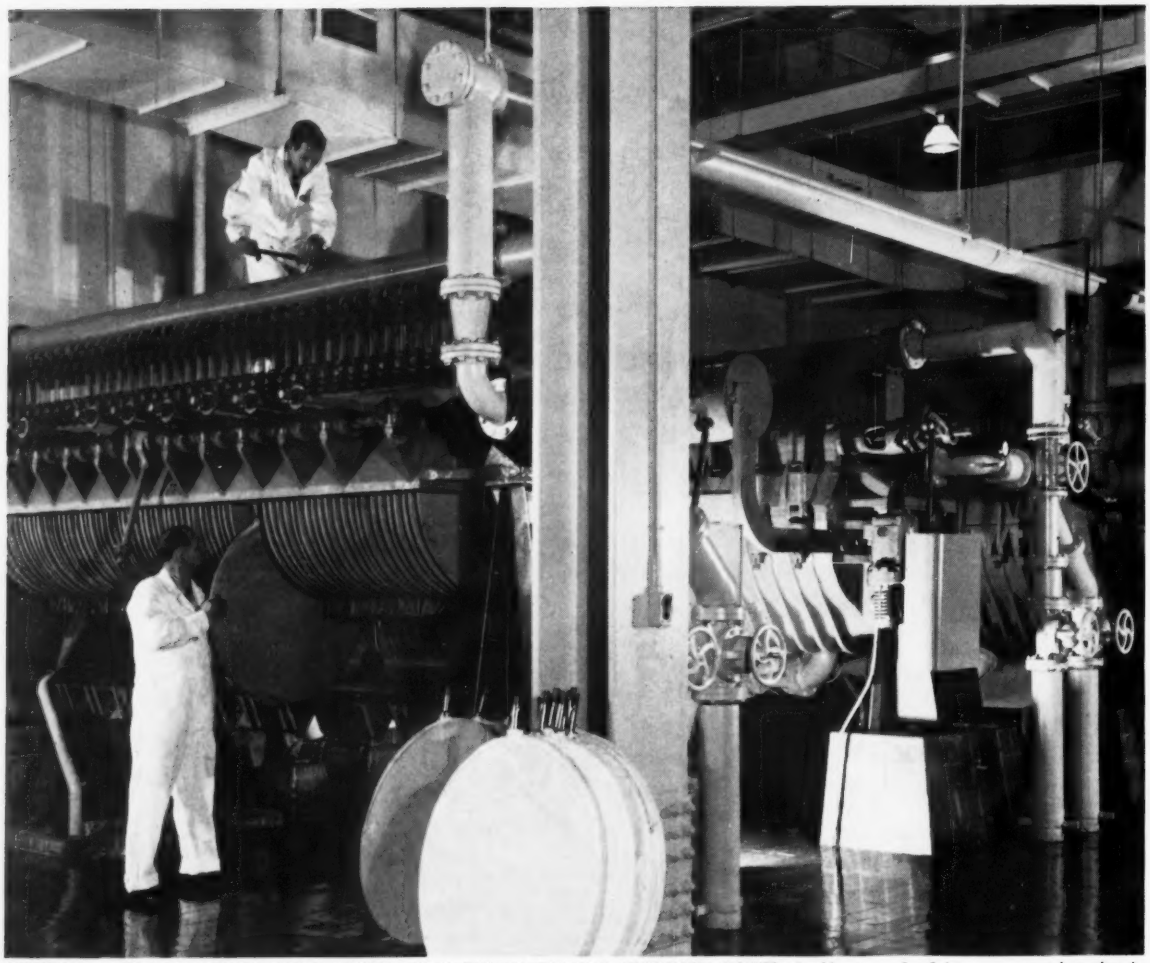


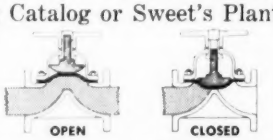
SWEETLAND PRESSES AT REDPATH SUGAR EQUIPPED WITH GRINNELL-SAUNDERS DIAPHRAGM VALVES—At this stage of refining, raw sugar has already been washed, dissolved, mixed with lime—and the lime and impurities in sugar precipitated with carbon dioxide gas. The resultant mixture is filtered through the Sweetland press to remove participant. Workmen are shown replacing the leaves in one of the Redpath Sweetlands.

Keeps sugar crystals from abrading working mechanism, avoids valve sticking, and prevents product leakage

A big problem in refining sugar is to prevent damage to the working mechanism of the usual type of valve by the eroding action of sugar crystals. Failure to do this means that sooner or later valves won't close tightly — resulting in messy, unsanitary, costly-to-repair leaks.

At Canada and Dominion Sugar Company's Redpath Refinery, in Toronto, Canada, Grinnell-Saunders Diaphragm Valves help avoid these problems. The diaphragm separates working parts from the fluid stream — preventing erosion of valve mechanisms on the one hand, and sticky or "frozen" valves on the other.

Grinnell-Saunders Diaphragm Valves are available in a wide range of body, lining and diaphragm materials. For more details, see Grinnell's insert in Chemical Engineering Catalog or Sweet's Plant Engineering File — or communicate with the Grinnell Company.



GRINNELL-SAUNDERS DIAPHRAGM VALVES

GRINNELL COMPANY, PROVIDENCE 1, R. I. • BRANCH WAREHOUSES AND DISTRIBUTORS FROM COAST TO COAST
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FOOD
FOR MANAGEMENT

FEBRUARY 1960

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ANNUAL EDITORIAL INDEX OF FOOD ENGINEERING's 1959 issues is available at 35¢ a copy. Order on Reader Service Card.

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A special antioxidant in STANOIL gives the oil resistance to *chemical* change. Deposits are minimized. The oil has a high viscosity index, is resistant to *temperature* change. It lubricates effectively at both high and low temperatures. Due to special refining techniques, STANOIL will not readily emulsify. A special additive minimizes foaming. STANOIL has a low pour point. It flows freely at low temperatures. A rust inhibitor in STANOIL "plates out" on metal surfaces.

W. P. "Sandy" Wehking, the Standard Oil man who calls on Hunter Packing Company, has plenty of experience in technical service work. He's been at it for 17 years. Sandy studied chemistry at Blackburn College. He has also completed the Standard Oil Sales Engineering School.

To get more information about STANOIL Industrial Oil and to obtain technical help on your lubrication problems, call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about
STANOIL Industrial Oil

- Antioxidant gives oil resistance to chemical change, minimizes deposits.
- Inhibitor "plates out" on metal surfaces, prevents corrosion.
- Receives special refining to eliminate emulsion problems. Contains additive to minimize foaming.
- High viscosity index. Resists temperature change.

You expect more from **STANDARD** *and you get it!*

Temperature check. Frank Persson of Hunter Packing Company and Standard Oil lubrication specialist W. P. "Sandy" Wehking inspect one of four compressors in Hunter plant that uses STANOIL Industrial Oil.

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NEW

fmc FLEXI-FILLER

MODEL ST—12, 18, 24 POCKETS

—the startling, all-new machine designed, developed and perfected by FMC for filling granular, free-flowing products into cans.

Incorporated in the *FMC Flexi-Filler* are way-ahead features of design and construction found in no other can filler. Its broad adaptability to handle free-flowing granular products (see partial list below), coupled with the ease of changing from one can size to another in a range from 211 to 603 diameters, give the *Flexi-Filler* a real flexibility all its own.

Here are just a few of its important features:

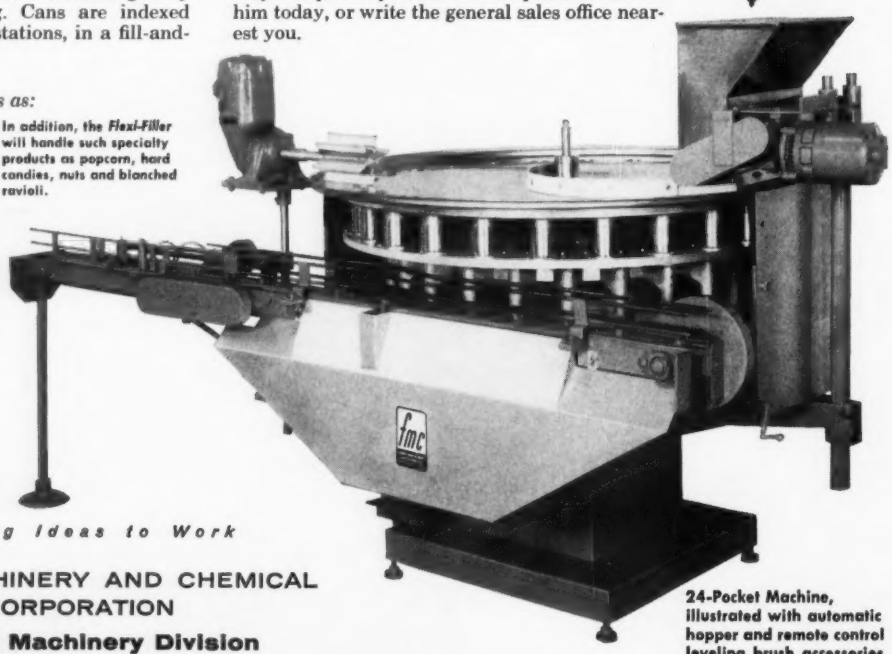
- ***Individual cut-off gates move with the pocket,*** eliminating "dead plate" abrasion problems, and permitting a highly accurate pre-measurement into telescoping pockets – with no product damage.
- ***Synchronized straight-line can travel*** greatly simplifies can handling. Cans are indexed positively under filling stations, in a fill-and-travel sequence that carries them through only 40° of filler's perimeter before they resume straight-line travel. This permits speeds up to 300 cpm, depending on can size and product.
- ***Individual Pocket "No can-No fill"*** prevents discharge from pocket unless can is properly positioned under it. Reduces spillage and waste.
- ***Cleaning up, no matter how frequent,*** is made easy because new design prevents product build-up, and permits thorough wash-down.

Your CMD representative will give you complete details and furnish recommendations based on your specific products and requirements. Call him today, or write the general sales office nearest you.

Designed for such products as:

Berries
Cherries
Prunes
Apricot Halves
Peaches, diced or sliced
Beets, small whole or diced
Carrots, diced
Potatoes, diced
Lima Beans
Kidney Beans
Hominy

In addition, the *Flexi-Filler* will handle such specialty products as popcorn, hard candies, nuts and blanched ravioli.



24-Pocket Machine, illustrated with automatic hopper and remote control leveling brush accessories

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
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TRENDS & FORECASTS

SPECIAL FOOD SERVICE to EXECUTIVES

Indicative of a good year for food, retail grocery sales were 12% higher at end of '59 than a year earlier, National Assn. of Retail Grocers reports.

Scoring gains outstripping 23% population growth in '47-'59 period are soft drinks, up 84%; canned and frozen foods, 81%; miscellaneous food preparations, 44%; fluid milk, 41%; meat products, 27%—according to Federal Reserve data. Home freezers gained 192%, favoring frozen foods.

Types of foods gaining slower than population were grain and bakery products, up only 21%; wine and liquor, 18%; confectionery, 17%; frozen desserts, 14%; beer and ale, 9%. Luxury spending tendencies are indicated by more than 400% increase in output of air conditioners, TV sets, clothes dryers, and boats.

Discretionary income for purchase of nonessentials will almost double by '70, predicts McCann-Erickson. This involves an increase of some $90 billions, and augers well for continued increase in demand for top quality foods.

Teen-age food consumers will increase by estimated 63% in decade, and these youngsters consume 20% more calories than adults, Borden executive says.

Ocean Spray Cranberries, Inc., recently laid off one-third of its work force and cut pay of remainder. '58 cranberry crop still had to be moved from store shelves and warehouses. Virtually all of '59 crop was backed up in freezers and warehouses.

Cranberry business is estimated to have lost $20 million since Flemming action. Trendex poll last revealed 3 of 4 consumers stopped eating cranberries.

Cocoa is expected to be in oversupply this year, with prices depressed, as result of big carryover and anticipated large crops.

Production of corn oil is seen hitting record level this year. In past two decades, consumption has doubled to 300 million lb.

Pack of canned tomatoes dropped 22.3% in '59 to 23 million cases. Tomato juices was off 15.8% to 27.5 million; tomato sauce, down 20.9% to 8.7 million; puree, minus 15.6% to 2.8 million; California tomato paste, off 25.3% to 6.2 million; catsup, down 9.1% to 25.8 million.

Chili sauce gained big 34.6% for '59 pack exceeding 2.8 million cases.

Canned green and wax bean packs declined 6.4% to 23.7 million cases.

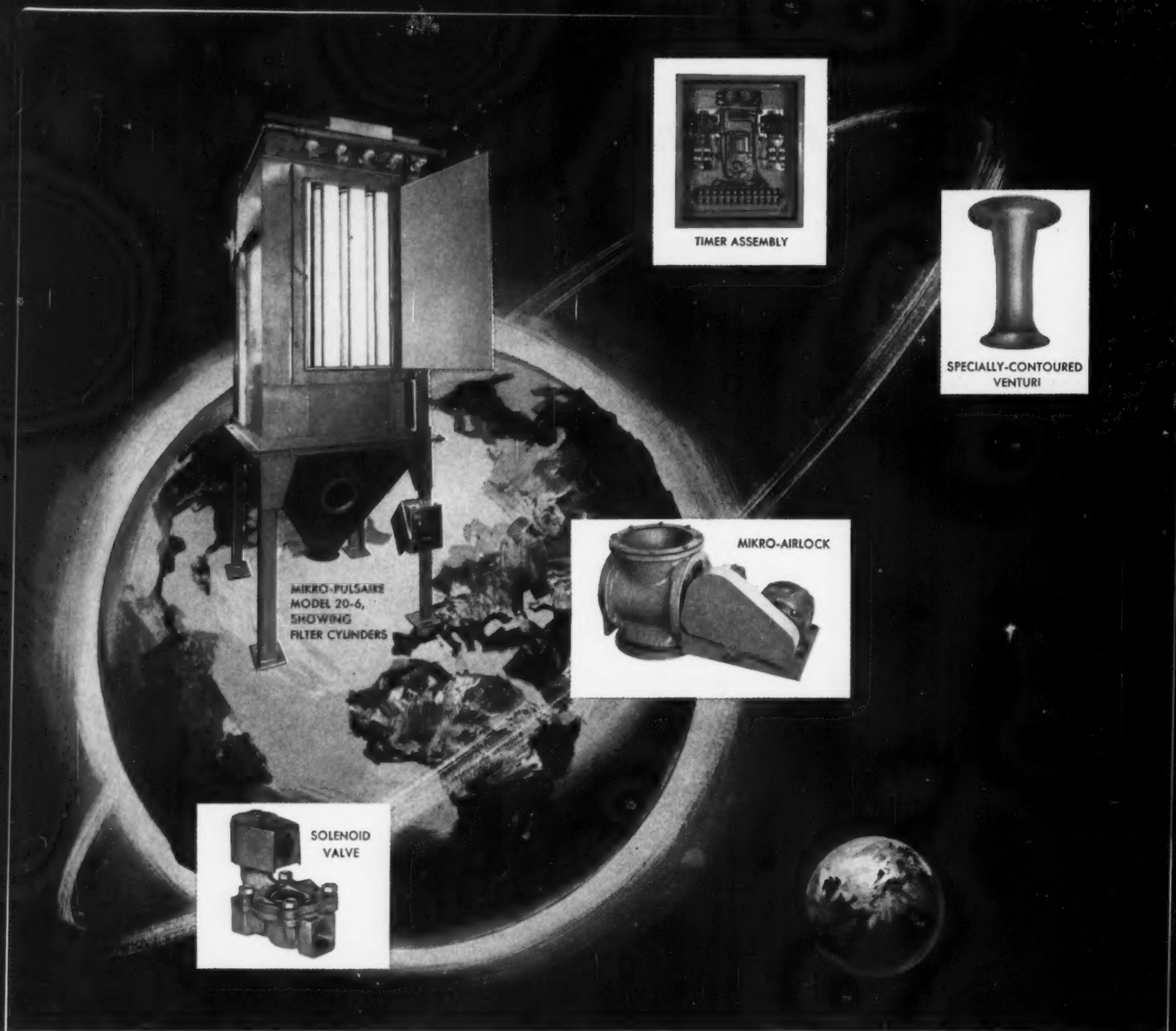
Pack of canned pears increased 20.5% to 11.8 million cases last year.

Exports of canned decidious fruits this season should be higher than 6.7% of U.S. sales exported last year, because of market opportunities and lower prices, in opinion of Foreign Agricultural Service of USDA.

All but 10 of remaining 34 limitations on import of foodstuffs from U.S. likely will be removed by West Germany before '62, in four stages of trade liberalization.

Wages will rise 9c. an hour, unions will fight hard for still more fringe benefits, and protection against "automation layoffs" will be demanded. These are predictions of Research Institute of America's Leo Cherne.

See Developments to Watch p. 13



THE ORBIT OF ACCEPTANCE . . .

It's still young enough to be called "new" . . . but the MIKRO-PULSAIRE is actually a veteran that's proving itself all over the world on virtually every type of product recovery and nuisance dust collection job. If you're looking for assurance of around-the-clock recovery, full-time automatic cleaning and absolute minimum maintenance, you'll find it in the MIKRO-PULSAIRE. It's a completely simplified unit, as the basic components illustrated above will show you . . . and yet it delivers a filtering efficiency of 99.9% plus, on a wide variety of dusts. Engineered for economy, the exclusive Mikro jet-action principle eliminates gears, cams, chains and other high replacement-cost parts inside the cabinet, and guarantees longer bag life, as well. There's a MIKRO-PULSAIRE for every collection job, including new modular construction units with capacities to any known requirement. Write for Bulletin 52A!

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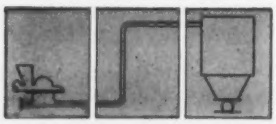

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MANUFACTURING FACILITIES: United States, Canada, Continental Europe, British Isles.

Schedule of Events

February

18-20—Western States Meat Packers Assn., convention; Sheraton Palace, San Francisco.

23-24—Dairy Engineering Conference; Michigan State U., East Lansing.

March

3- 4—Nutrition Conference; U. of Georgia, Athens, Ga.

6-10—National Assn. of Frozen Food Packers, convention, and Frozen Food Supplies & Equipment Exposition; Conrad-Hilton Hotel, Chicago.

7-10—American Soc. of Bakery Engineers, convention; Edgewater Beach Hotel, Chicago.

9-11—Western Candy Conference; Claremont Hotel, Berkeley, Calif.

18-19—Refrigeration Research Foundation, Scientific Advisory Council Symposium; LaSalle Hotel, Chicago.

21-24—Institutional Food & Supply Show; Trade Show Building, N.Y.C.

HORS D'OEUVRES

▶ **Jellied cherry sauce stepped into the cranberry niche nicely. One food's poison is another's promotion.**

▶ National Federation of Milk Co-operatives believes that public announcements should be made only when all facts are known—and when remedies are inadequate to meet the problem. What? Spoil Flemming's fun?

▶ **Secretary Flemming should learn that wise administration of the law is not dictated by his interpretation of it but by intent of the Congress that enacted it. Congressmen seldom are intent on wrecking industries for no real purpose.**

▶ In Morocco, the penalty for distributing foods containing lethal contaminants is death. As they say, things can always be worse.

▶ **Biochemists tell us that the average man of 170 lb. contains about 110 lb. of water. And psychologists say that some contain a fair amount of wind.**

▶ Recipes for new dishes were placed in hundreds of thousands of clean laundry packages in a promotion experiment. The more exotic the food the greater the splatter.

▶ **Teen-age girls have the worst diets—low in calcium, iron, thiamine, and vitamin C. Maybe the answer is fortified lipstick. It would improve the diet of teen-age boys, too.**

▶ It costs $10,000 to recruit, orient, and train a scientist or engineer, AMA reports. Food technologists should be able to get a raise just by looking at the door.

IN YOUR PLANT...

STOP THESE 10 LOSSES WITH NEPTUNE *liquid* METERS

1

STOP SPOILED BATCHES Get automatic formula control with Auto-Stop meters.

2 **STOP WAITING** for liquids to creep up to gauge mark. Let the meter do it!

3

STOP MANPOWER LOSS hauling buckets or bags. Meters do the measuring while pumps do the work.

4 **STOP GIVING AWAY INGREDIENTS** by over-measurement just to be sure.

5

STOP BACK CHARGES for rejects. Meters save customers.

6 **STOP GUESSING COSTS.** With meters you always *know*.

7

STOP HAZARDS of spilled inflammables or messy liquids. Meters keep 'em in the pipe.

8 **STOP RECEIPT LOSSES.** Meters *prove* any shortages.

9

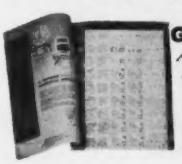
STOP SHIPPING LOSSES Meter - printed tickets give proof of honest delivery from your plant.

10 **STOP CONTAMINATION** of liquids... use Neptune Stainless meters.

METERING DOESN'T COST...IT PAYS BY MAKING THESE 10 SAVINGS REGULARLY IN YOUR PLANT.

NEPTUNE DOES ALL THESE THINGS FOR YOU:

- Cuts off flow at preset quantity
- "Memorizes" formulas of repeated batches
- Prints batch tickets showing amount delivered
- Controls pumps electrically
- Measures over 150 liquids... water, oils, syrups, brines, soaps, chemicals, etc.



GET THE FACTS

Ask for helpful Meter Data Bulletin 566 XF See Neptune Data Pages in Chemical Engineering Catalog.

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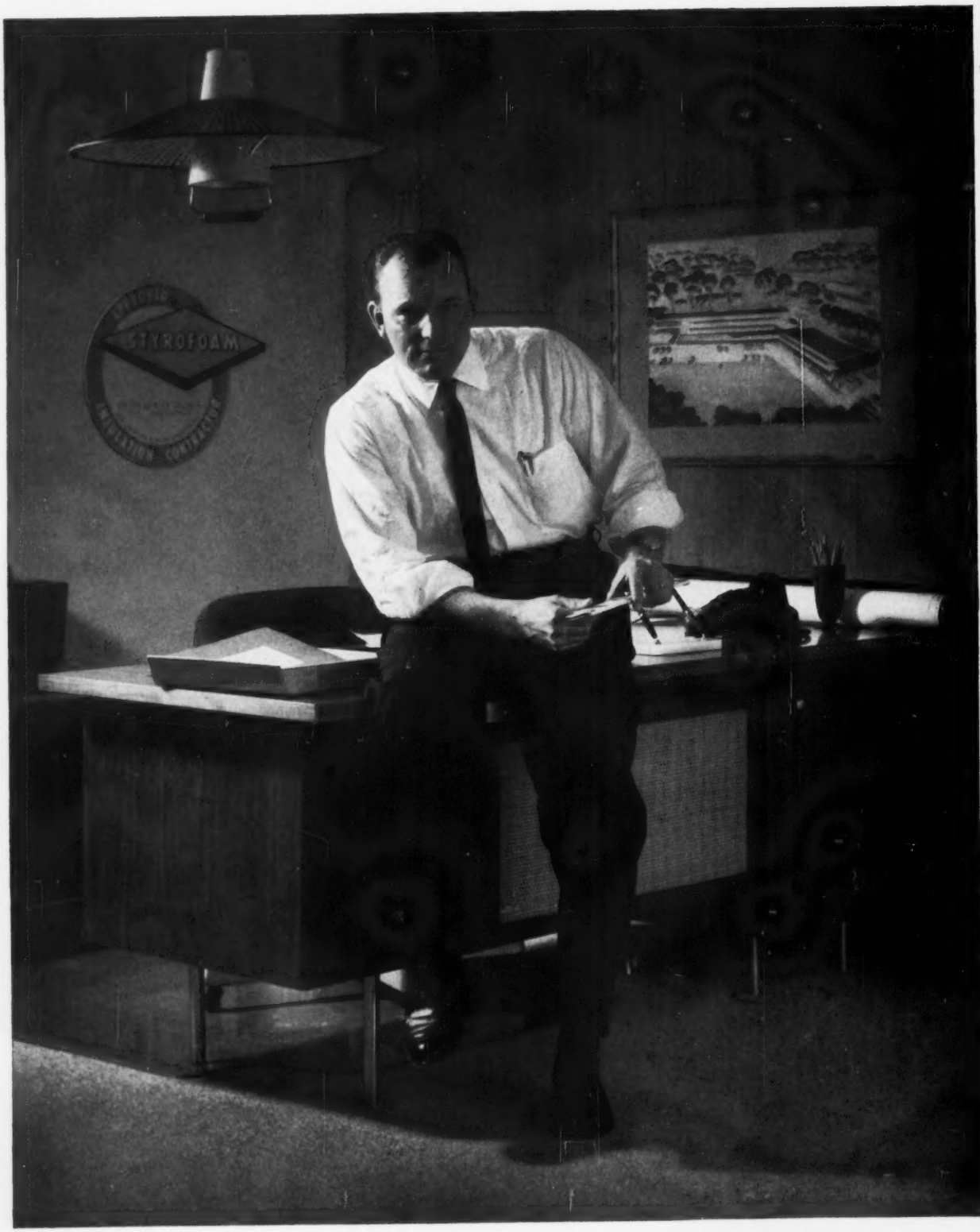

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AND LOW-TEMPERATURE INSTALLATION, TOO

HE'S AN APPROVED INSULATION CONTRACTOR, typical of the special group of low-temperature insulation contractors that Dow has selected for their outstanding experience and abilities in installing Styrofoam*. Each Approved Insulation Contractor listed below has a reputation for top-quality workmanship. All 77 of these firms are thoroughly familiar with Dow recommendations for installing Styrofoam, and they are committed to follow these recommendations on every job.

Consult an Approved Insulation Contractor when you're planning your next freezer or cooler room. The superior *insulating* performance of Styrofoam, teamed with the superior *installing* performance of an Approved Insulation Contractor, is your assurance of a top-quality job.

*DOW'S TRADEMARK FOR ITS EXPANDED POLYSTYRENE.

SAVE THIS LIST FOR REFERENCE

For the best low-temperature installation, get in touch with the Approved Insulation Contractor near you.

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North Sacramento
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Goldsboro
Bonitz Insulation of Eastern Carolina, Inc.
Greensboro
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Houston
Gulf Insulating Corporation
Amarillo
Young Sales Corporation

VIRGINIA
Norfolk
C. C. Foreman & Sons, Inc.
Roanoke
Whitescarver Engineering Co., Inc.

WASHINGTON
Seattle
Associated Asbestos, Inc.
Fiberglas Engineering & Supply Div.
Spokane
Fiberglas Engineering & Supply Div.
Yakima
Reese & Sons

WEST VIRGINIA
Charleston
Asbestos & Insulating Co., Inc.

WISCONSIN
Madison
Industrial Material Company
Milwaukee
Sprinkmann Sons Construction Co.
Manitowoc
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NEW FROM ROCHE

WATER-DISPERSIBLE DRY BETA CAROTENE BEADLETS (TYPE 2.4-S)

On addition
WATER-DISPERSIBLE

after 10 seconds
WATER-DISPERSIBLE

after 45 seconds
WATER-DISPERSIBLE

BETTER Selling Looking Colored LIQUID FOODS

with New *Dry* Safe

Beta Carotene Beadlets

(Type 2.4-S, Water-Dispersible)

1. *Better, because . . . Water-Dispersible, Fast* — Roche Dry Beta Carotene Beadlets (Type 2.4-S) are almost instantly dispersible in water and fruit juices (see illustration). A clouded effect similar to that produced by fruit insolubles is contributed. The bland-tasting beadlets have good stability.

2. *Better, because . . . Edible, Free-Flowing Beadlets* — Tiny droplets of beta carotene are enclosed in dry, edible, free-flowing, water-dispersible Beadlets. They standardize the color of such foods as:

- Fruit juices
- Fruit drinks
- Juice concentrates
- Mellorine
- Baked goods
- Cheese
- Eggnog
- Gelatin desserts
- Dessert toppings
- Puddings
- Confections
- Egg yolk products
- Creamed foods
- Soups
- Other foods having a water base

3. *Better, because . . . Absolutely Safe* — Beta carotene Roche is the pure, man-made "duplicate" of the product which nature has widely distributed in the vegetable foods we human beings have been eating for thousands of years.

4. *Better, because . . . Colors Easily Standardized* — Color is easily standardized from yellow to orange depending on the amount of the Beadlets used.

5. *Better, because . . . Vitamin-A-Potent* — Each gram of the Type 2.4-S Beadlets provides approximately 40,000 U.S.P. units of vitamin A activity.

6. *Better, because . . . Mesh Sizes Varied* — The Roche beadlet particles represent a combination of commercial 30 to 80 mesh material.

OTHER FORMS OF ROCHE BETA CAROTENE PRODUCTS IN VEGETABLE OIL

Widely popular for use in certain oil-base foods, these are: 30% Beta Carotene Liquid Suspension • 24% Beta Carotene Semi-Solid Suspension • Blends of Beta Carotene and Vitamin A • Blends of Beta Carotene to specified dilutions.

Ask your Roche salesman or write to the Vitamin Division for free samples.

VITAMINS COME *RIGHT* FROM ROCHE

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • Nutley 10, N. J.

In Canada: Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

DE[illegible]ENTS TO WATCH

FOOD

Designed to compete with key-opening cans, new container has small groove between lid rim and double seam, where metal is cut by special side opener. Cut edges are smooth, lid can be replaced. W. F. & John Barnes has it.

Can with sides made of 0.003-in. aluminum foil heat-laminated to both sides of plastic sheet will withstand beer carbonation pressures and high vacuum. Barnes-developed container would be economically made by user.

By 1970, glass containers will be 50% stronger, more shock-resistant and 20-30% lighter, Knox Glass executive predicts. More efficient production techniques are in operation now.

New sterile Tetra-Pak process has been licensed to Carnation, Maryland and Virginia Milk Producers, Bireleys, and North Carolina State College by Real Fresh Milk. Equipment installations are to be completed in March.

Steaks and other meats can be aseptically canned in new process developed for QMC. Meat is steam sterilized quickly at 300F. to retain fresh-roasted color, flavor, texture. It is filled dry or with gravy into presterilized cans in steam atmosphere.

Synthetic mushrooms made in chemical process will be put on market soon.

Tenderness of raw meat is measured with new USDA device which applies pressure until meat begins to extrude through hole in cylinder. Instrument correlates with taste panel evaluations of cooked meat.

Precise amount of dry ingredient is automatically fed in given time by diminishing-batch Syntron unit. Poise on scale beam of weigh hopper supplying vibrating feeder is gradually retracted by constant speed screw, and beam is kept in balance by electronic control of feeder speed.

Beef irradiated at 10 megarad for 18 hr. with cobalt-60 by Chicago Midway Labs was no more radioactive than untreated samples.

Chemically treated bone removed 80% of strontium from milk in University of Minnesota tests. Strontium replaces some of calcium in bone.

Researchers have launched crash program to develop mechanical harvesting of tomatoes to solve picking-labor shortage and cost problems. Suitable tomato varieties are required, as well as harvester.

Commercial application of foam-mat drying of whole orange juice is aim of new cooperative research by USDA and Florida Citrus Commission.

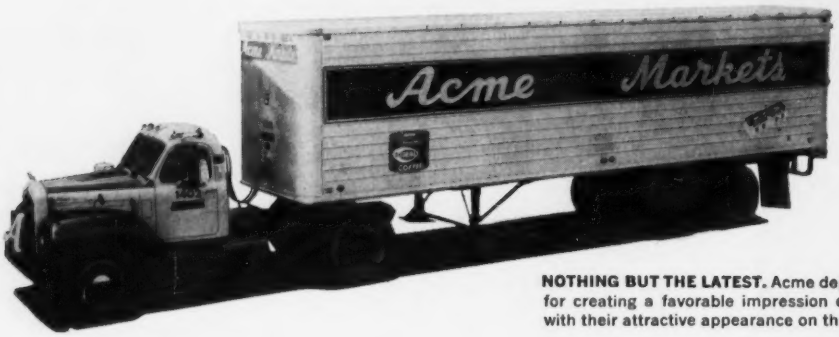
Sugar cane juice will be dehydrated for animal feeds by new Cuban plant. Production goal is 300,000 tons a year.

Exact chemical make-up of protein ribonuclease has been determined at Rockefeller Institute, which identified 1,876 atoms, including carbon, hydrogen, oxygen, nitrogen, and sulfur in protein's 124 amino acids.

Boon to sanitarians is new water-like fluid said to make paint so smooth that dust cannot cling. Based on colloidal silica, Du Pont product forms hard, transparent coating in 15 min. at ¼¢ per sq. ft.

Albumen content of milk is determined optically in Russian-developed technique. Light striking albumen forms ultra-violet rays that activate meter.

Use of cargo containers in Hawaiian trade is being expanded by Matson Navigation Co. with 820 new 24-ft. containers, 120 refrigerated.



NOTHING BUT THE LATEST. Acme depends on Macks for creating a favorable impression of the company with their attractive appearance on the road.

Acme Markets rely on their 150 MACKS for delivery on time, every time

Delivering the goods for American Stores Company, whose Acme Markets form a leading East Coast grocery chain, are 150 Mack tractors.

Acme's Macks work night and day hauling up to 60,000-lb. gross loads to the company's 820-store chain of supermarkets. These Mack tractors assure on-time delivery every time, while permitting Acme to operate with fewer, more centrally-located warehouses.

Thanks to Mack Thermodyne® engine power and Balanced Design—the exclusive Mack practice of manufacturing all its major components, which enables Macks to work as smooth-running, integrated units—Acme's Mack tractors cost far less to maintain and operate. Like all Macks, they outperform other trucks in heavy-duty service and outlast them, too.

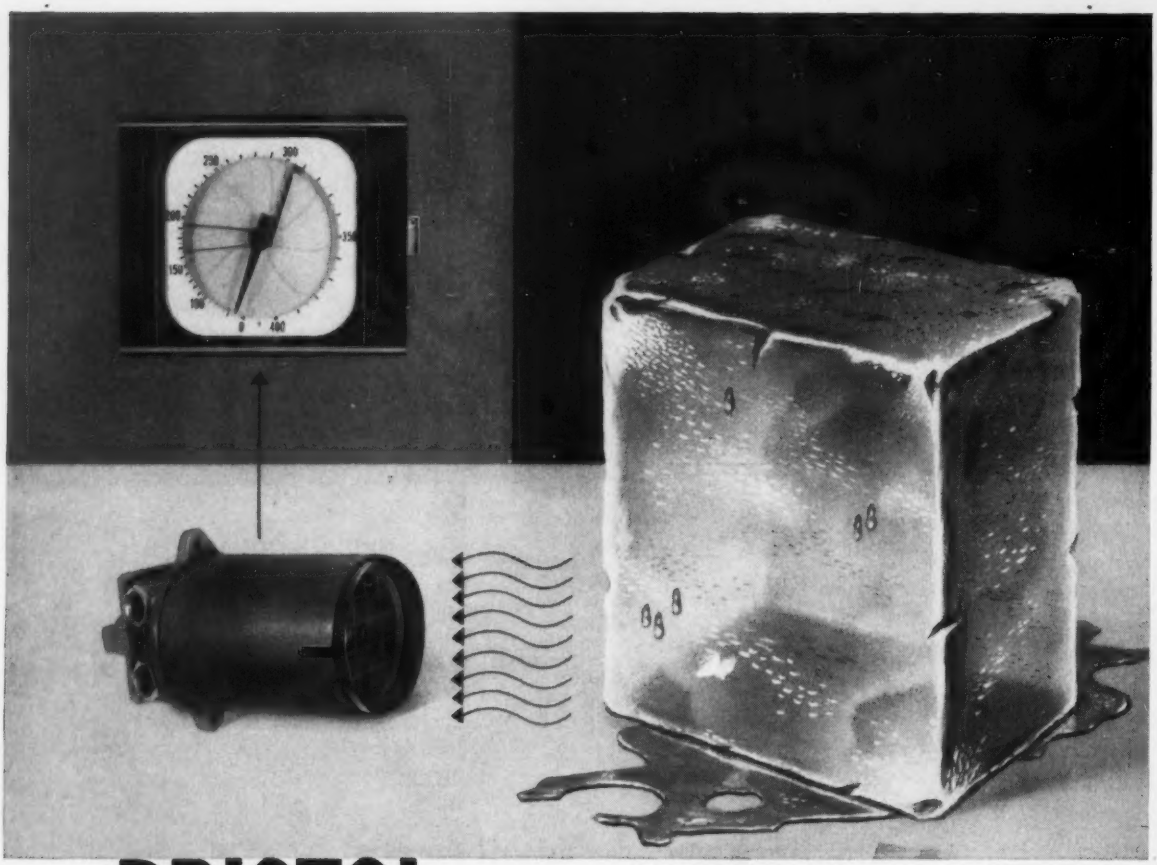
Before purchasing a new unit, contact your Mack branch or distributor. Let him show you why only Mack can meet your needs when it comes to performance, economy and long life. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

MACK
FIRST NAME FOR
TRUCKS

VAST SCOPE of Acme's Philadelphia warehouse operations is shown in this photo. Huge plant shows trend of distribution in which larger, centrally-located warehouses take the place of numerous smaller ones.

READY TO ROLL are these Mack B-60 tractors operating out of Acme's Philadelphia warehouse. All in all, American Stores Company has 150 such units supplying its vast chain of East Coast supermarkets.

ON THE MOVE with fresh commodities for 820 supermarkets are several of the 150 Mack tractors operated by American Stores Company. These units operate day and night, insuring a fresh supply of groceries and other foodstuffs every shopping day.



new BRISTOL low-range radiation pyrometer

IDEAL FOR NO-CONTACT, CONTINUOUS TEMPERATURE MEASUREMENTS ON

Rubber	Plastics
Synthetic rubber	Carpeting
Tile	Mineral aggregates
Roofing shingles	Chemical flows
Adhesives	Petroleum flows
Blackened or unpolished aluminum	Beverage flows
	Reactor kettles
	Mill rolls
Textiles, synthetic and natural fibres	Furnace or oven charges or exteriors
Paper	Foundry molds

...and many other substances; web processes or products; conveyed, rolled or extruded products; and stationary objects.

0-200° F and other ranges to 1100° F • Direct reading charts, scales in F or C • Calibrated interchangeable head units • Automatic built-in ambient compensation • Easy emissivity compensation

Here's the first radiation pyrometer that really gets down to 0° F.

It's the Bristol Velotron Pyrometer System—so sensitive you can sight the radiation unit (at lower left above) on your hand and get an accurate temperature indication.

And on the high end, spans and ranges are available up to 1100° F or corresponding ranges in degrees Centigrade.

Charts and scales are direct reading, in degrees F or C, even on the lowest ranges. No laborious calibration runs, calculations; no curve consulting needed! And you get famous Bristol Dynamaster* Recorder accuracy —proven in thousands of installations.

Ambient temperature compensation is automatic, completely contained in recorder unit (no third unit needed), and allows use in ambients up to 135° F.

A simple knob adjustment allows compensation for emissivity characteristics of target material from black body on down.

Interconnection cables are standard copper wire; no special, preselected lengths required.

Write for complete technical data on this outstanding new Bristol contribution to industrial pyrometry. The Bristol Company, 115 Bristol Road, Waterbury, Conn. 9.31

T. M. Reg. U. S. Pat. Off.

BRISTOL...for improved production through measurement and control

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

←CIRCLE 15 ON READER SERVICE CARD

CIRCLE 16 ON READER SERVICE CARD

WHO'S BUILDING WHAT...

Monthly Report: Food firms to spend $17,225,819 for expansion.

Proposed Work

Abbotts Dairies, Philadelphia, cold storage facilities, $300,000.

Carolina Grain Co., Greenville, N. C., grain elevator, $450,000.

Columbia Co. Grain Growers, Inc., grain elevator, Dayton, Wash., $450,000.

G. W. Freds Sausage Co., Philadelphia, meat processing plant, $250,000.

Morton's Frozen Foods, Inc., Crozet, Va., frozen foods factory, $200,000.

Mrs. Paul's Kitchens, Feasterville, Pa., frozen food plant, $2,000,000.

Contracts Awarded

Ak-Mak Bakeries, Inc., Fresno, Calif., bakery plant, $1,500,000.

Armour & Co., Houston, Tex., meat packing, processing, and distributing center, $1,950,000; South San Francisco, Calif., meat processing plant, $1,800,000.

Burny Bros. Bakeries Inc., Northlake, Ill., bakery, $3,000,000.

Carnation Co., Houston, Tex., creamery plant addition, cold storage, $1,000,000.

Colonial Provision Co., Inc., Roxbury, Mass., meat plant addition, $150,000.

Continental Baking Co., Ogden, Utah, bakery facilities, $134,600.

Great Atlantic & Pacific Tea Co., Baltimore, Md., bakery warehouse, $1,000,000.

Metropac Industries, Everett, Mass., nut meats manufacturing plant, $330,000.

Ottenburg's Bakers, Inc., Washington, D. C., bakery, $626,219.

Quaker Oats Co., Barrington, Ill., storage, research, and office facilities, $600,000.

R. L. Reid, Inc., Houston, Tex., poultry and egg processing plant, $135,000.

Seven-Up Bottling Co., Miami, Fla., bottling plant, $350,000.

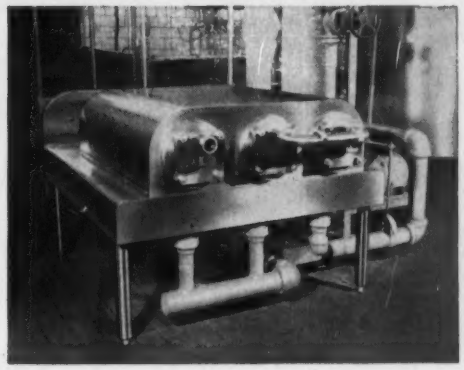
Others

J. A. Folger & Co. have requested bids for construction of new coffee plant in Kansas City, Mo.

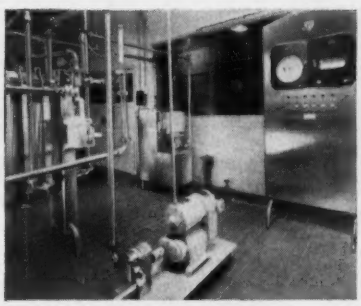
Foremost Dairies has broken ground for construction of a $1,000,000 milk processing plant in Montgomery, Ala.

MANUFACTURING

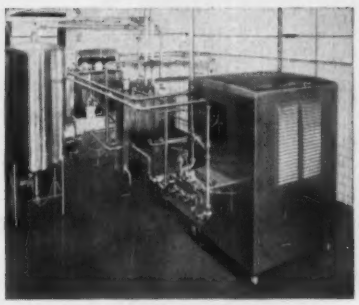
4 Creamery Package Units for Profitable Processing



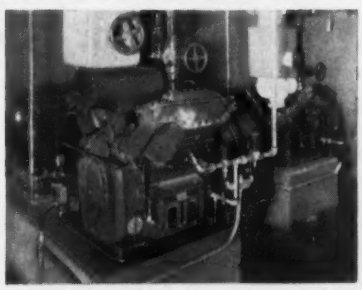
SWEPT-SURFACE® HEATER and COOLER—
provides economical continuous heating and cooling of liquids or semi-solids; −30° F. to 300° F. Blades continuously sweep product from heat transfer surface—eliminate "burn-on" during heating, increase product yield. Bulletin E-1300.



SANITARY POSITIVE PUMP
New rotors have specially designed resilient surfaces, save wear on case. Ideal for metering flow of liquids. Quick, on the job parts replacement. Also available in single-lobe model for large-piece products. Bul. H-1290.



HIGH EFFICIENCY HOMOGENIZERS
Completely redesigned for smoother, more efficient homogenization at much lower pressure than others. Reduces power costs and machine wear. Includes revolutionary, high capacity 5-cylinder models. Bul. N-1292.



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For any temperature −60° F. to +50° F. Compact design saves space—extra rugged construction saves maintenance. Full line of compressors, boosters and 2-stage combination package units. Write for bulletins.

COGMILL GRINDER-BLENDER
Grinds and blends solids, emulsions, or liquids to any consistency; particles .020" to 1" diameter. Sanitary, stainless steel product surfaces. Portable or fixed mountings. Bulletin N-1406.

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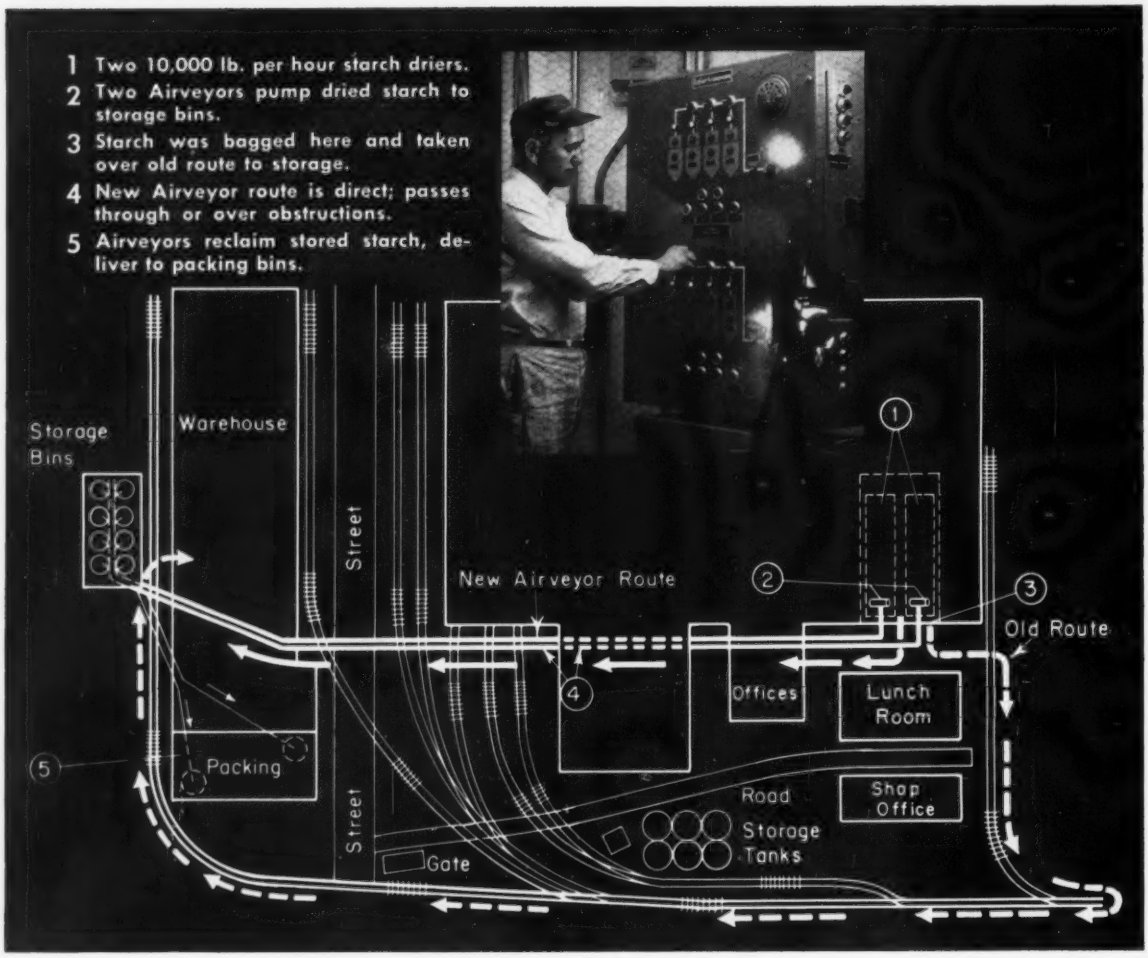
THE MARK OF DISTINCTION IN FOOD PROCESSING EQUIPMENT

CIRCLE 17 ON READER SERVICE CARD



PLANT MODERNIZATION THROUGH PNEUMATIC CONVEYING

FULLER pneumatic conveying system increases production without plant expansion

To increase production, the Union Starch and Refining Company's Granite City, Ill., plant first needed to expand their materials handling system. But a complete revamping of bagging and warehouse operations was impossible because there was no space available for necessary new buildings.

An Airveyor® System, engineered and built by Fuller, was the answer. Airveyor's extreme flexibility allowed it to be set up through walls, along sides of buildings, over streets, on roofs and up inclines. At Union Starch, the total distance covered is 800 feet, with a number of 45 degree and 90 degree bends in the line.

The Fuller Airveyor system transports the starch in two phases, from the driers to the storage bins and from the bins to receiving hoppers over the bagging machines. Flow is controlled automatically through control panels located in the drier room and at the bagging machines. Other controls are also provided at the panels for automatic operation of components such as feeders, blowers, conveyors and filter-receivers.

Besides being easily installed and automatically controlled, the Fuller system reduces both the amount and the expense of handling. Additional savings are made possible by Airveyor's self-cleaning facility, which greatly reduces maintenance costs.

Why not work with Fuller to design an automated pneumatic materials handling system that will help you cut costs and increase production? Write today for complete details. A-280 1355

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Flashes From the Additives Front

With FDA's tough additive-safety deadline only 3 weeks away, things are happening thick and fast.

Of particular concern are latest developments on 'White List' exemptions, the flow of petitions for tolerances, and the pleading for time extensions.

▶ **'White List':** Nearly 500 food additives are now listed as safe without need for further proof. And the more thus cleared, the easier the reckoning on March 5.

▶ **Tolerance petitions:** Some 80 of these have come in, along with supporting data. But so far none has been officially approved by FDA.

▶ **Requests for more time:** Easements beyond the deadline have been asked on another 30 additives. And the first such dispensations have been granted on carbon black and charcoal, used in licorice, jelly beans, etc. FDA saw no undue risk in permitting their employment an extra year (maximum ratio 0.4%) while testing continues.

Still boiling meantime is the Packaging Institute's appeal. It asked FDA for a blanket 1-yr. extension on all additives being eyed relative to migration into foods from plastic, paper, metal, or other container material.

Chances here aren't so good. FDA Commissioner Larrick hints that such wholesale extension can't be deemed justifiable.

Ike's Budget Boosts $$$ for FDA

As finally posted, Ike's fiscal-'61 budget sets $18 million as FDA's working fund for the year starting July 1—a very plump boost as contrasted with the late '59 running figure of $13.8 million.

The new money will spark a 19% increase in staff, including a rise in the inspector roster from 499 to 593. And labs in Boston, Cincinnati, Kansas City, and Minneapolis will be enlarged and modernized.

Further, a good portion of the funds will go toward studies of radiological contamination of food.

Flemming 'Rides It Out' at White House

The latest White House move on the food additives issue still finds HEW Secretary Flemming set in his saddle, despite USDA complaints.

White House Assistant Don Paarlberg got together with USDA Secretary Benson and Flemming in an unpublicized meeting. Benson wanted Flemming to go easier, institute a "rule of reason." Flemming insisted the law leaves no room for administrative discretion where a cancer factor is concerned, and if a product contains even an iota of a cancer causing agent, it's out.

Getting the law changed was cited as the one path to modification.

On this score, USDA is having its innings in current hearings on color additives. Benson feels, with much justification, that there should be room for scientists to exercise discretion.

But it's hard to risk the appearance of being "soft" on cancer. Hence, it's figured that the upcoming color legislation is sure to support Flemming with a clause matching the "cancer amendment" that Delaney tagged on the Food Additives Law.

Meanwhile, nine farm groups pressed the White House to name a committee of scientists to study the whole problem.

Farm organizations would like to see some of FDA's responsibilities shifted to USDA, where they have more influence.

Most recent word was that the Flemming-Benson differences were touched on in the President's late-January Cabinet meeting. However, the consensus of members was merely that the two Departments should aim for better coordination.

Hit Army's Shutdown on Food Raying

Army's abandonment of its Lathrop, Calif., food-raying program is under attack by Joint Atomic Committee members, AEC officials, and even some powers in QM itself.

The protests came at the recent Congressional hearing on the decision to drop the proposed $7.5-million Ionizing Radiation Center (FE Nov. '59, p. 21).

A study by Arthur D. Little Co. found neither economical or logistic advantage for military use of irradiated foods, as compared with frozen foods, according to Army R&D Chief Richard Morse.

It was Morse who cancelled the program. And he claimed his action had full support of both Army's Chief of Staff and its Advisory Scientific Committee.

But Sen. Clinton Anderson countered that he knew the termination shocked AEC Chairman McCone. Moreover, other AEC officials, present at the hearing, indicated surprise at the rapidity of the Army move.

Morse declared the Army now considers the low-level approach more appropriate—that is, use of radiation in minor amounts just sufficient to pasteurize foods, rather than in heavier doses that completely sterilize the foods. Possibility of hazards in eating rayed foods also figured in delaying the contemplated plant, Morse said.

OK Numerous Seasonings, Flavorings

More than 150 natural seasonings and flavorings have now been cleared by FDA as safe.

Seven substances failed to get the initial nod—quinine, red and yellow cinchona barks, two forms of orris

(*Turn to p. 21*)

BRIEFS

Radioactivity on fresh fruits has run only 1/10th of that on fresh vegetables over past 2 yr., reports FDA. Other findings: Washing of spinach in canning or freezing plants cuts radioactivity 60%. Wheat continues to show highest strontium 90 content of any food.

Dairy price supports will 'stay put' at the levels of the last 2 yr.—reflecting virtual disappearance of dairy surpluses (FE Nov. '59, p. 21). Included in pegging are prices paid to processors for cheese and powdered milk. Guaranteed purchase prices for butter will come later.

Easement in the Case of the Caponettes was USDA's offer to buy 1,195,700 lb. of stilbestrol-treated poultry (prices averaging 43.63¢ a lb.).

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corn syrups • corn starches
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Lactic Acid

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CLINTON

CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA

root, wintergreen, and methyl salicylate. It's expected, however, that they'll later win safe-level acceptance. Complete approved list—

(1) Spices and Other Natural Seasonings and Flavorings Derived From Leaves, Roots, Barks, and Berries:

Allspice; Anise, star; Basil, sweet; Basil, bush; Bay; Calendula; Capers; Capsicum; Caraway; Caraway, black (black cumin); Cardamom (cardamon); Cassia, Chinese; Cassia, Padang or Batavia; Cassia, Saigon; Cayenne pepper; Celery seed; Chives;

Cinnamon, Ceylon; Cinnamon, Chinese; Cinnamon, Saigon; Clary (clary sage); Cloves; Coriander; Cumin (cummin); Cumin, black (black carraway); Dill; Fennel, common; Fennel, sweet (finocchio, Florence fennel); Fenugreek; Garlic; Ginger; Glycyrrhiza; Grains of paradise;

Horseradish; Lavender; Licorice; Mace; Marigold, pot; Marjoram, pot; Marjoram, sweet; Mustard, black or brown; Mustard, brown; Mustard, white or yellow; Nutmeg; Oregano (oreganum, Mexico oregano, Mexican sage, origan); Paprika; Parsley;

Pepper, black; Pepper, cayenne; Pepper, red; Pepper, white; Peppermint; Poppy seed; Pot marigold; Pot marjoram; Rosemary; Rue; Saffron; Sage; Savory, summer; Savory, winter; Sesame; Spearmint; Star anise; Tarragon; Thyme; Turmeric; Vanilla; Zedoary.

(2) Essential Oils, Oleoresins (Solvent-Free), and Natural Extractives (Including Distillates):

Allspice; Almond, bitter (free from prussic acid); Angelica root; Angelica seed; Angelica stem; Angostura (cusparia bark); Anise; Asafetida; Balsam of Peru; Basil; Bay leaves; Bay (myrcia oil); Bitter almond (free from prussic acid); Bois de rose;

Cananga; Capsicum; Caraway; Cardamon seed (cardamon); Carob bean; Cascarilla bark; Cassia bark, Chinese; Cassia bark; Padang or Batavia; Cassia bark, Saigon; Celery seed; Chamomile flowers, Hungarian (camomile); Chamomile flowers, Roman or English (camomile);

Cherry, wild, bark; Chicory; Cinnamon bark, Ceylon; Cinnamon bark, Chinese; Cinnamon bark, Saigon; Cinnamon leaf, Ceylon; Cinnamon leaf, Chinese; Cinnamon leaf, Saigon; Citronella; Citrus peels; Clary (clary sage); Clove bud; Clove leaf; Clove stem; Coca (decocainized);

Coffee, Cola nut; Coriander; Cumin (cummin); Cusparia bark; Dill; Estragole (esdragol, esdragon, tarragon); Fennel, sweet; Fenugreek; Garlic; Geranium, East Indian; Geranium, rose; Ginger; Glycyrrhiza; grapefruit; Guava; Hoarhound; Hops; Jasmine; Juniper (berries);

Kola nut; Laurel leaves; Lavender; Lavender, spike; Lavandin, Lemon; Lemon grass; Licorice; Lime; Locust bean; Mace; Mandarin; Marjoram, sweet; Mate; Mustard; Maringin; Neroli, bigarade; Nutmeg; Onion; Orange, bitter, flowers; Orange leaf; Orange, bitter, peel; Orange, sweet;

Origanum; Palmarosa; Paprika; Parsley; Pepper, black; Pepper, white; Peppermint; Peruvian balsam; Petitgrain; Petitgrain lemon; Petitgrain mandarin or tangerine; Pimenta; Pimenta leaf; Pipsissewa leaves; Pomegranate; Prickly ash bark;

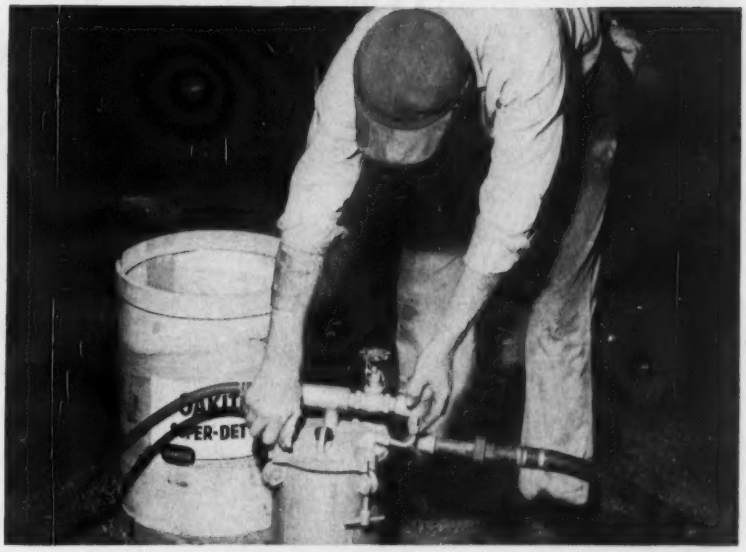
Rose absolute; Rose (otto of roses, attar of roses); Rose geranium; Rosemary; Rue; Saffron; Sage; Sage, Spanish; St. John's bread; Schinus molle; Spanish sage; Spearmint; Spike lavender; Tangerine; Tarragon; Tea; Thyme; Thyme, white; Tuberose; Turmeric;

Vanilla; Violet leaves absolute; Wild cherry bark; Ylang-ylang; Zedoary bark;

(3) Miscellaneous:

Civet (zibeth, zibet, zibetum); Cognac oil, white and green; Musk (Tonquin musk).

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



New Oakite SUPER-DET detergent cleans super-fast, rinses super-clean

This new detergent cuts cleaning time two ways! First, it gives superior wetting-out action: penetrates and loosens stubborn soil in extra-fast time. Second, it rinses without streaking, leaves no dulling film, no "missed spots" that require re-doing.

SUPER-DET is versatile, too. Sweeps through fats, grease, baked-on proteins, syrup, wax, dairy residues and similar food industry soils. Yet, it's completely safe on every type of metal, paint, rubber, plastic—even the most sensitive hands.

The big PLUS in Oakite

Continuing product development is only one of the big plus factors you get with Oakite materials. Others include: the personal assistance of the Oakite man, backed by the vast experience of the entire Oakite organization . . . sanitation methods coordinated to save man-hours and material . . . cost-cutting equipment . . . materials *guaranteed* to perform. Ask your local Oakite man to demonstrate SUPER-DET in your own plant. Or, write for Bulletin B-7139. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

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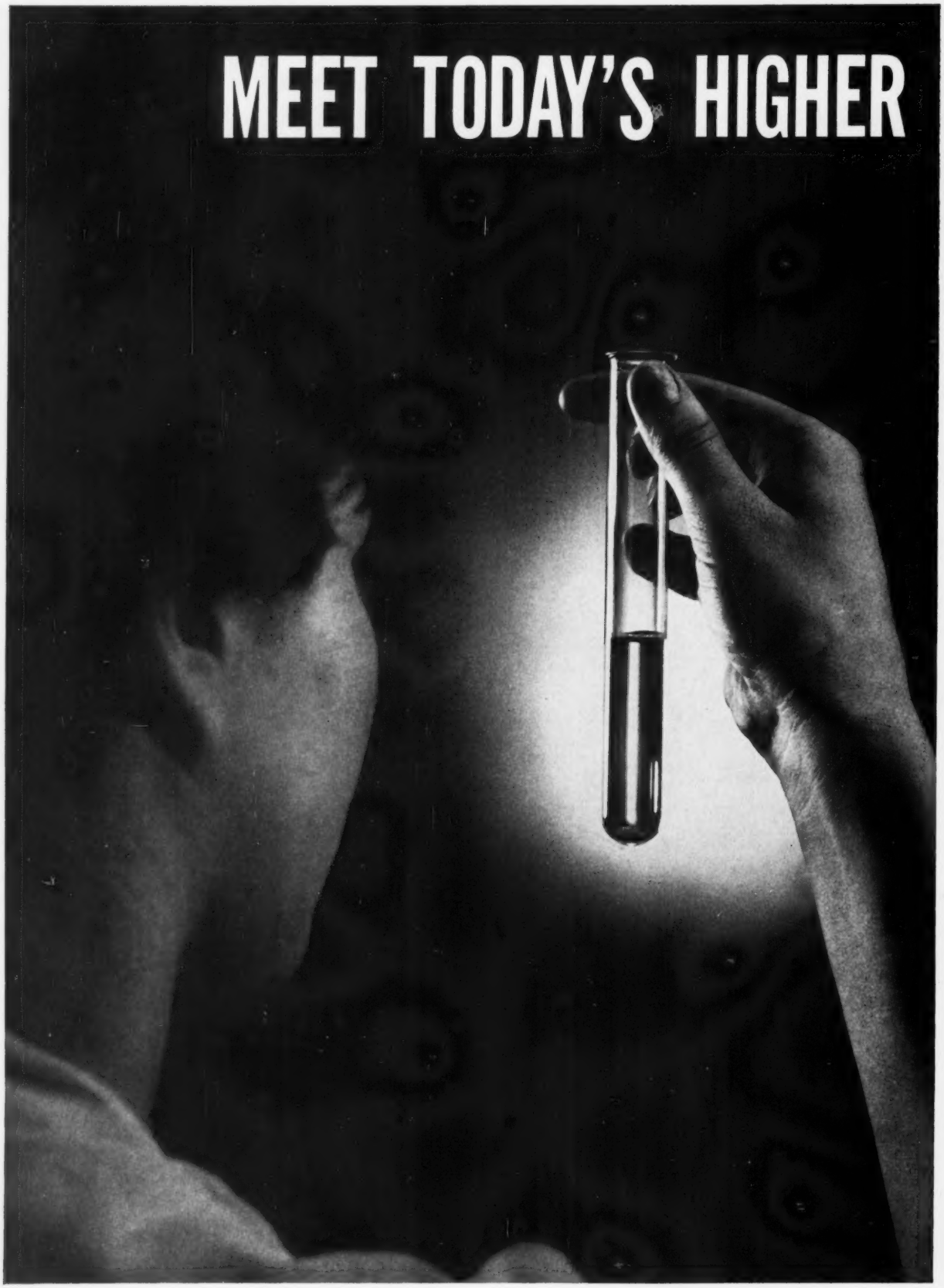
CIRCLE 21 ON READER SERVICE CARD


MEET TODAY'S HIGHER

PURITY STANDARDS WITH DICALITE FILTERAIDS

DICALITE OFFERS NEW CUSTOMIZED FILTERAID SERVICE

Today, standards of purity are tightening in every field—and tomorrow's will be higher still. But you can confidently meet both with the high-efficiency filteraids which Dicalite is producing right now.

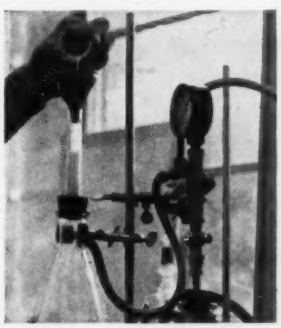
Today, with new processing advances made through continuing research, Dicalite can custom-engineer a filteraid made to precisely match your individual purity problem.

If your filtration must be so sharp that it removes particles too small to be seen with the optical microscope, a Dicalite Filteraid can do it. Or, if fast flow rates and increased production are your need, Dicalite can help you achieve that.

Your Dicalite man will be glad to advise with you on any filtration problem and help you determine if a customized filteraid will advance your processing.

Careful strata selection provides the best crude for each filteraid's final requirements.

New processing refinements, including special calcining methods, control filteraid characteristics with an accuracy never before possible in any plant.



With more than 22,000 quality control tests every month, the Dicalite plant laboratories hold every filteraid grade to rigid specifications.

New automatically-controlled packing and pressure-palletizing is the final step in efficient modern operation.

Dicalite®

Dicalite Department
Great Lakes Carbon Corporation
612 So. Flower Street, Los Angeles 17, Calif.

The product I am filtering is _____

_____

Have Dicalite man phone for appointment ☐ Send Information ☐

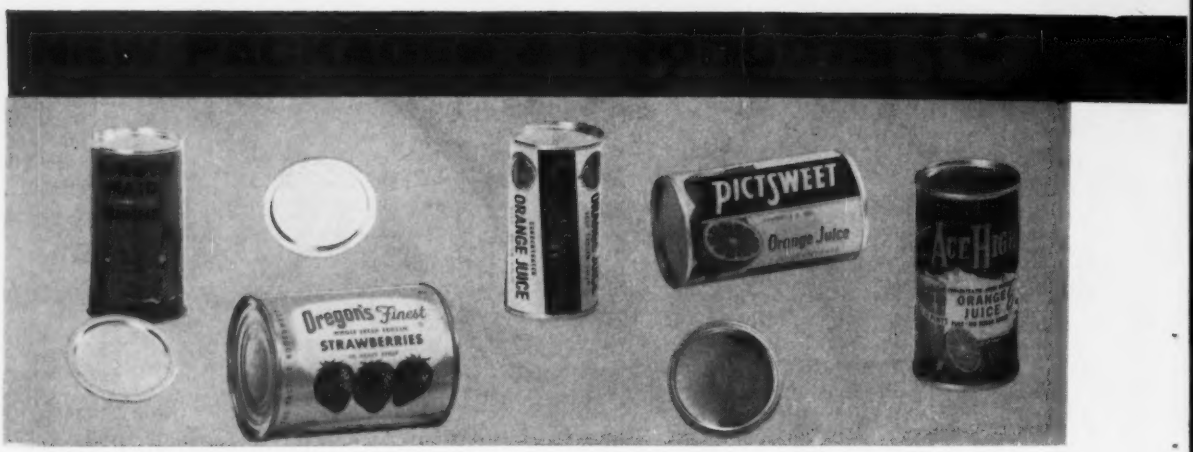
NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



Conventioneers See Latest in Aluminums

Attracting considerable attention at last month's Canning Machinery & Supplies Convention in Miami were some of the latest developments in aluminum containers, which bid fair to gain a firm foothold in food packaging.

Most of the packages exhibited at the Aluminum Co. of America booth are in the concentrated juice field, but aluminum for frozen fruits and tuna fish also made their appearance.

Libby has already reported a 100 million can trial. And Minute Maid has stepped in with a limited amount of concentrated orange juice in 6-oz. size. Several other companies are awaiting further market reports before launching any major moves in the aluminum sphere.

Reasons cited for aluminum breakthrough are:

- **Increasing cost of tinplate, expected to continue as an effect of the recent steel strike.**
- **Better resistance to rust.**
- **Weight reductions for added freight savings.**

Firms report that consumer prices will remain about the same, since suppliers are said to absorb price spread between aluminum and tinplate.

Added aluminum ideas for the "lighter market basket" include can ends to be used with tinplate, and aluminum aerosols for ketchup, mustard, soft drinks, coffee concentrate, etc. **Circle 402 on Reader Service Card**

Tear-String Pouch Eases Opening

Pouch-opening problems are practically eliminated with new easy-opening tear string introduced by Kraft Foods for its line of transparent-packaged sliced cheeses.

String, marked "Tear here," opens pouch along side (rather than across top) for easy slice removal.

Firm has also redesigned package, giving more prominence to "Kraft" name, enlarging product name, and adding solid color panels at top and bottom.

Products in new package include Cheddar, Swiss, Brick, Muenster, Caraway, Monterey Jack, and 10-oz. Longhorn chunk cheese.

Market Mexican-Style Dinners

Enchilados, tamales, and tacos are among the latest Mexican style frozen dinners, entrees, and appetizers now distributed nationally by Rosarita Mexican Foods, Inc., Mesa, Ariz.

Full-color pictorial design packaging offers sharp contrast to competition in frozen food cabinets for valuable point-of-sale attention. Reds, greens, and yellows are dominant colors on carton, which also features Rosarita trademark.

Carton supplier is Marathon Div., American Can Co. **Circle 403 on Reader Service Card**

Introduce "Sanitary" Safe-Edge Can

A new metal container from W. F. & John Barnes Co. that leaves no jagged edges and protects contents from opener blade was introduced at the Canning Show.

The "Bogner" can has end seal designed for "sanitary" side-opening and lid can reclose container.

Intended to compete with key-opening cans, container costs but $1 more/M than standard can, compared to extra cost of $8-$10/M for key-opening type. Specially designed opener is termed safer and easier than key.

Can has standard double end seam, and only special manufacturing equipment needed is $15,000 unit that curls rim for blade. **Circle 404 on Reader Service Card**

Now—Jam In the Can

A full line of gourmet preserves, packaged in colorful, 2-lb., 2-oz. cans, is being introduced by Wm. Barnes Co., Minneapolis.

Switch from glass jars to key-opening cans, supplied by American Can Co., features reclosing lid, longer shelf-life, and protection from light discoloration. Heavy lacquered inside prevents corrosion from fruit acids.

Flavors include strawberry, apricot, red raspberry, peach, blackberry, and orange marmalade. Attractive lithographed design on non-breakable containers permits can to be used right on consumer's table without need of dispensing dish. **Circle 406 on Reader Service Card**

'Funnel' Carton for Frozens

Major savings in carton costs and reduced product spillage are reported with new Funnel Pak for frozen food packaging.

Container has no over-lapping of paperboard at front and side walls, making carton less expensive than other paperboard packs. Funneling effect of four top flaps permits easier filling and reduces loss.

Suppliers, Container Corp. of America, report only minor machinery modifications are necessary.

Carton is expected to apply to many frozen foods now being top-loaded. **Circle 405 on Reader Service Card**

Fish and Clam Chip Promotion

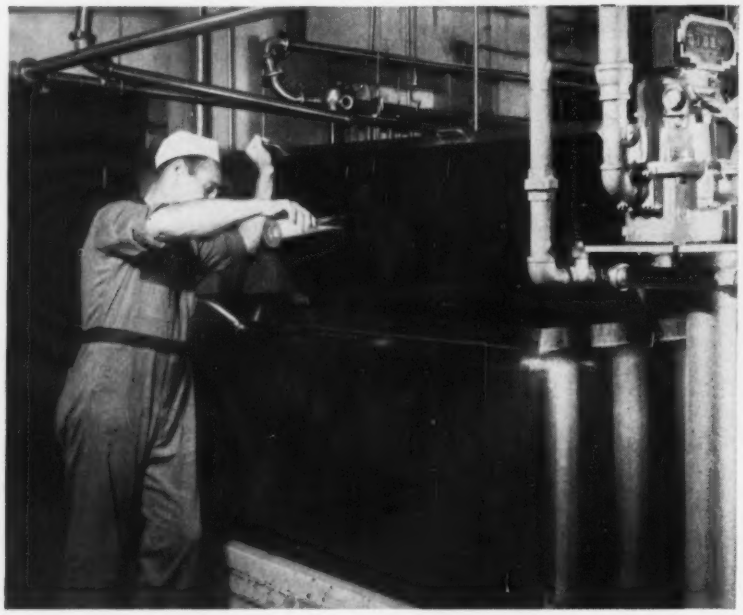
Two new seafood products, Clam Chips and Fish Chips, are being backed with a "Be Our Guest" theme which gives consumer a free package coupon for label from either product.

Both cubed products, from Gorton's of Gloucester, are french fried and packed in attractive waxed overwrapped 7-oz. containers. Clam Chips package is illustrated with sandy shore background and Fish Chips feature colorful sea design.

Gorton's also announces plans to package shrimp products in a newly-acquired Miami plant.

SILICONE NEWS from Dow Corning

Prevent Costly Foam



Dow Corning Silicone Defoamers Reduce Waste, Increase Capacity

Foam is costly . . . it takes up production space, slows down processing, causes maintenance problems—may even create a fire hazard! You can control foam once and for all with the most effective antifoams ever developed: Dow Corning silicone defoamers.

Odorless, tasteless, and physiologically harmless, Dow Corning silicone defoamers are used extensively in processing and packaging foods, syrups, and antibiotics. Effective at extremely low concentrations and safe to use, they neither alter nor contaminate the end product. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; water-dilutable Antifoam AF Emulsion may be used at concentrations to 34 ppm.

IN FREEZING MIXES

A typical application: in making Fudgsicles, foaming of milk, chocolate and other ingredients caused numerous rejects of frozen bars and also cut production space. Antifoam AF Emulsion added to the processing prevents foam . . . helps keep production up and costs down.

IN ANTIBIOTICS

Write for a FREE SAMPLE giving an indication of your foaming problem and whether it's in an aqueous or oil system. Address Dept. 5502.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

26 CIRCLE 26 ON READER SERVICE CARD

INDIVIDUAL liquid sugar portions for iced tea, lemonade, iced coffee, and other drinks, eliminates excessive stirring and hard-to-clean residue. Leedpak Inc. makes the polyethylene-coated packs. (407)

New Product Shorts

Minute Spanish Rice Mix, Baby Butter Beans, and three frozen dinners, meat loaf, fish, and chopped beefsteak, are latest products from General Foods.

Frozen doughnuts from Chock Full O' Nuts are now in supermarket freezer cases. Eight/pkg. retails at 39¢.

Honegar, produced by B. T. Babbit, is being test-marketed in major cities. Combination of honey and vinegar, this food, says maker, can also be used in basting, salad dressings, and even as a cocktail mix.

Freckles, chocolate malted milk egg with a sugar shell coating, is new Easter-season item from Blumenthal Bros. Chocolate Co., Philadelphia.

Packaging Briefs

Pliofilm 65 BG, new "tailor-made" packaging film for high-speed machine-packaging of baked goods, is announced by Goodyear Tire & Rubber Co. Overwrap costs $1.10/lb., and film yield is quoted as 38,000 sq.in./lb. (408)

Portable cooler display for super markets has dry ice compartment that protects frozens for 10 hr. Sara Lee is using Stone Container Corp. development for line of frozen cakes. (409)

Ketchup cap with shortened flange and reduced liner thickness, from Alcoa, costs 12% less than standard Alcoa caps. Firm reports 30% savings in transportation costs because of light weight. (410)

High-speed rotary heat sealer for flexible packaging materials has pressure-resistant nylon conveyor belts and can operate at 100-1,500 in./min. Food Machinery & Chemical Corp. is distributor for Australian-developed machine. (411)

Just Between You and Your Customer

Transparency is beautiful, to be sure. But to convert casual tasters into faithful customers, your package must also provide sure product protection . . . protection that never lets the customer down.

Whatever you want . . . transparency or opacity; flexibility or rigidity; moisture retention or moisture prevention . . . you will find a Riegel material to meet your requirements. More than 600 different kinds to choose from: pouch papers, paperboards, glassines, foils, films and laminations . . . waxed, plastic coated, printed or plain . . . tailor-made to your needs.

For technical advice or samples, write to Riegel Paper Corporation, 260 Madison Avenue, New York 16, N. Y.

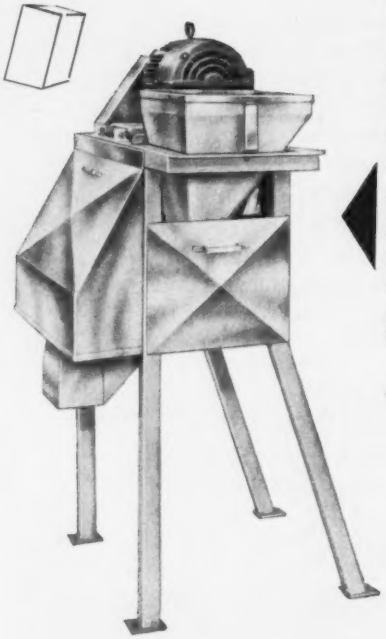
Riegel

PROTECTIVE PACKAGING MATERIALS

Peak Nut Co. uses Riegel POLYFANE™ to protect its tantalizing products while they display themselves at point-of-sale. Pouches are formed, filled and heat-sealed at high-speed on Lynch equipment.

Versatility

is the big word for the Urschel Model **RA DICER, STRIP-CUTTER AND SLICER**



For Pickles, Vegetables, Fruits, Candied Fruits, Fruit Peel

The New Urschel Model **"RA" Dicer, Strip-Cutter and Slicer** gives you these *new* advantages: *widest range of cuts—from relish sizes of 1/16" x 1/8" x 1/8" to full 3/8" cubes, strip-cuts and slices ▶ more perfect dices than ever before ▶ operating speeds are quickly changed to provide the best dicing efficiency for various products and size cuts desired—means maximum capacity and higher quality cuts ▶ saves your valuable process syrups ▶ no product crushing—all the juice is locked in ▶ plugging is avoided by more direct product transfer from slicing to dicing knives ▶ stainless steel product contact surfaces ▶ one motor instead of two—mounted above operating parts for complete protection ▶ capacity up to 10,000 lbs. per hour*

The new "RA" Dicer replaces the model "R" unit in the Urschel line

Write today. Complete information promptly on request.

B.F.Goodrich

No scrubbing, no scouring— belt comes clean quickly, easily

B.F.Goodrich Highseal belt lasts longer, is easy on the eyes

THE conveyor belt on this cake-icing table has to be cleaned 8 or 10 times a day. When a coated cotton belt was used here, the bakery had problems. The belt was hard to clean, water shrank it. Frequent scrubbings wore down the thin top coating on the belt, caused cracking and peeling.

Then a B.F.Goodrich distributor recommended an improved conveyor belt, developed by B.F.Goodrich for handling many kinds of food. A special rubber compound gives this belt, called Highseal, good resistance to cooking oils, animal fats, most acids, moisture —and just about everything else that ruins most belts. The B.F.Goodrich belt has no odor, no taste, never gets rancid.

Food particles can't grind into the smooth, polished surface of the belt—so there's no need to scrub or scour it. Just an easy wipe with a damp cloth and the belt is as clean as the day it was put on. It doesn't absorb moisture, so there's no waiting around for the belt to dry out.

After two years, the Highseal belt you see here still looks like new, is expected to give many more years of service. Employees who work at the icing table like the belt's light green color, find their job easier, more pleasant.

Your B.F.Goodrich distributor has full information on this belt and can tell you about its many other advantages for food-handling operations. *B.F.Goodrich Industrial Products Company, Dept. M-803, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

CIRCLE 29 ON READER SERVICE CARD

GET 300%* MORE USEABLE PRODUCT PER HOUR

Full 360° screen is an exclusive Stokes feature. Shown are two of the many screen sizes available.

in granulating
pulverizing
mixing
shredding
pulping
chopping
dispersing
recovering...
a wide range of wet and dry food materials

with the STOKES TORNADO MILL

More and more food processors are finding Stokes Tornado Mill provides outstanding performance and versatility. Its exclusive 360° screen assures an average of 300% more useable material per hour... resists clogging even in processing wet and sticky materials. What's more, no special treatment is required for heat sensitive material. For thorough cleaning, the entire grinding chamber, including rotor and blades can be completely disassembled in a matter of minutes. All contact parts are fabricated from stainless steel to guard against contamination. With the Tornado, you can switch from one product or operation to another easily and quickly.

For complete details, including specific performance comparisons on typical materials, write today for Bulletin 350.

**Average, based on processing of dry granulation*

Process Equipment Division
F. J. STOKES CORPORATION
5500 Tabor Road, Philadelphia 20, Pa.

STOKES

Additives Problems Call for Corrective Action

"Since the blitzkrieg publicity about contaminated cranberries, I have received a continuous flow of letters from customers. They say that, according to the label, my canned crabmeat contains an additive. And they won't buy it anymore.

"This additive is approved by FDA, and I have been using it for years without previous complaints.

"What's more, I had planned to use another additive in my canned fish to prevent formation of struvite and discoloration. Now I'm afraid to use it because of consumer antagonism to all additives."—Food company president.

Wrong button will set off FDA flash

"I feel that if the 50 odd substances in coffee were tested similarly to the chemical in the cranberry case, over half of them would cause cancer in rats.

"Another thing. A chemical can be used in chicken feed to the extent of 2 ppm., under FDA directive, to prevent intestinal coccidosis. Now if some feed mill employee accidentally pushes the wrong button, we will have Secretary Flemming issuing a warning that no one eat any chickens."—Food technogolist.

"What a mess the Additives Amendment has created for us! We don't know whether we're coming or going. The situation has become so acute that some of our top executives are in Washington talking to Congressmen."—Junior executive in packaging material firm.

We are asked not to identify the people making remarks such as those above. They fear FDA reprisal, and FDA does have some fearsome weapons.

But we can identify the independent food technologists who said:

"There can be little doubt that people generally regard smoked foods as safe. . . But ask the expert if any of the smoke constituents have ever been found to induce cancer in animals, and he would have to answer affirmatively. The significance of this question is that no such additive to food is considered safe under the provisions of our food law."—B. L. Oser, Food & Drug Research Laboratories.

Take steps to correct situation

We give you but a glimmer of industry concern about the additives mess. Yet it is enough to point up the need for action. And we make these suggestions:

1. To allay the fear it has planted in the minds of consumers, FDA should permit the statement, "Approved by Food & Drug Administration," to follow mention of approved additives on labels.

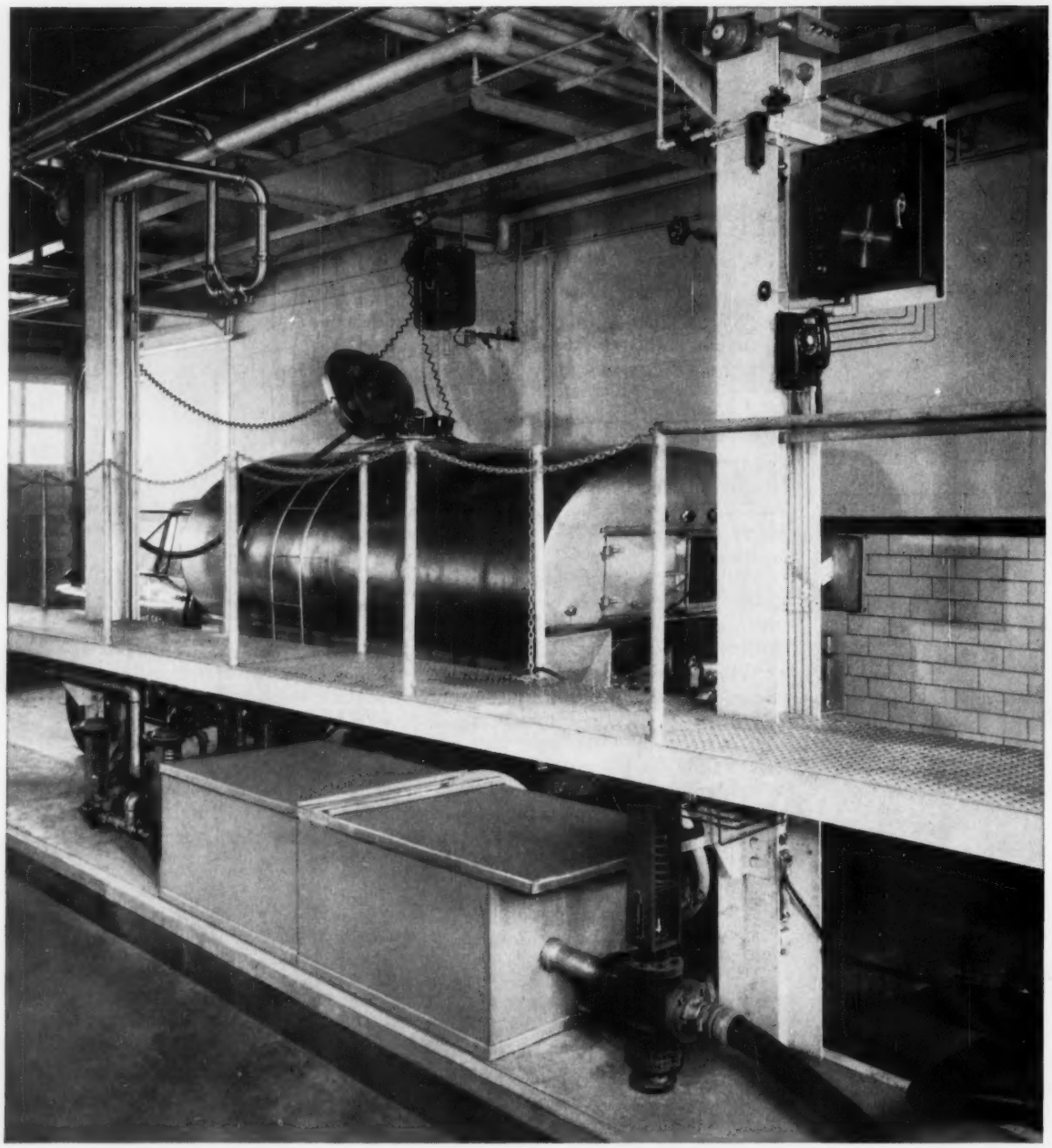
2. Industry associations, especially Grocery Manufacturers of America, should quickly start a campaign to educate food editors of consumer publications in respect to additives and the food law.

3. Food companies and associations should educate Congressmen about all phases of the additives mess. They should request postponement of the effective date of the Additives Amendment for at least a year. And they should demand changes in the Amendment. Modification or deletion of the Delaney cancer clause is essential.

Mr. Flemming's present prescription is bad medicine for the health of the food industry and the long-range welfare of consumers.

P.S.—Tell the editor of FE about your particular additive troubles. We shall keep the source confidential, but bring the problems into the open.

CIP for Tanker or

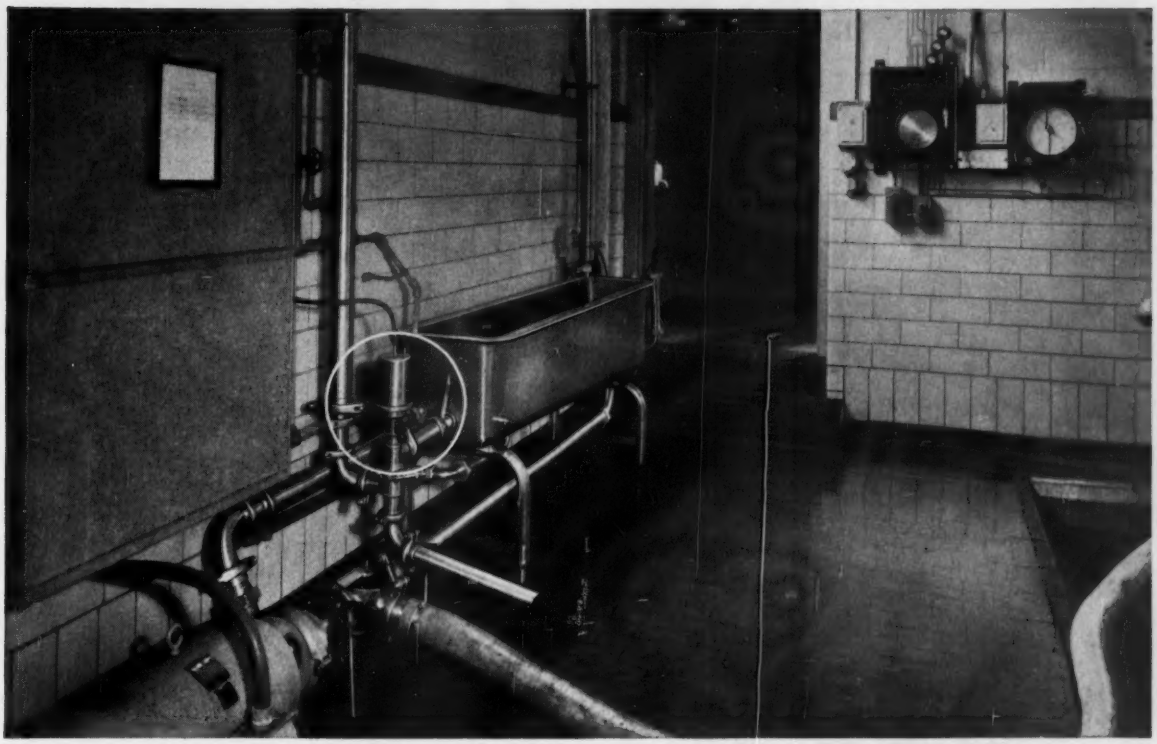


CIP in operation on a tanker at Sealtest Foods Division, National Dairy Products Corporation, Rochester, N. Y. Taylor FLEX-O-TIMER® Timed Program Controller (upper right) determines sequence and duration of cleansing cycle. Solution temperature is also regulated by a Taylor Controller (not shown).

Taylor Instruments

In-Plant-Cleaning?

Sealtest Foods benefit from both... under Taylor Automatic Control



In-Plant CIP equipment at Sealtest Foods. FLEX-O-TIMER Time Cycle Controller (left) regulates sequence and duration of cleansing cycle, also automatically adjusts the set points of the FULSCOPE® Controller (right) to insure correct solution temperatures for all phases of the cycle. Note also the Taylor-Emmett all-stainless steel valve actuator on the 3-way valve of the solution tank (circled).

CIP is just plain good business, both in your plant and for your tankers, because:

1. It is the only really thorough way to clean your equipment, year in, year out.
2. It cuts your labor costs.
3. It protects your equipment investment by extending its life.
4. It eliminates an unpleasant, time consuming chore.

If the engineering for your CIP system has been completed, your Taylor Field Engineer will be glad to specify the required instrumentation. If not, contact your preferred equipment supplier or source of cleaning chemicals . . . and be sure to specify "Taylor equipped as usual."

• • •

Taylor Instrument Companies, Rochester, New York, and Toronto, Ontario.

®Reg. U.S. Pat. Off.

MEAN ACCURACY FIRST

Taste Appeal... Eye Appeal... Buy Appeal with...

OK BRAND

DRI-SWEET

CORN SYRUP SOLIDS

More successful processors are recognizing the advantage of a single conditioner-sweetener like OK BRAND DRI-SWEET Corn Syrup Solids.

DRI-SWEET fortifies *Taste Appeal* by keeping comminuted meats at the peak of their natural deliciousness. Retains flavor and juices without over sweetening.

DRI-SWEET puts more into *Eye Appeal* because this pure, transparent and nutritious carbohydrate from corn syrup preserves appetizing colors. Reduces watering-off and shrinkage. Binds meat particles for more appealing texture (easier processing, too!)

Proper taste and eye appeal add up to greater *Buy Appeal.* Only OK BRAND DRI-SWEET performs so well, yet is so economical and easy to use. Available in 2 popular forms: OK BRAND DRI-SWEET 42 D.E. Coarse and 42 D.E. Powdered. All available in convenient 100 lb. moisture-proof bags.

"The Man From Hubinger" is ready to offer detailed advice on how OK BRAND DRI-SWEET can improve your comminuted meats. If he hasn't called on you, write, wire or phone today for prompt attention to your needs.

THE HUBINGER COMPANY
Keokuk, Iowa
NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA

"Knox furnishes us the packages that sell," say executives of major olive and pickle packer

"When packed in glass, stuffed olives—with their eye-catching colors—are a real stop signal to grocery store shoppers," says the manager of the olive department of one of America's leading food packers,* a major user of Knox glass.

"In our olive department, for example, 85% of the glass jars we use—in nine different sizes—are Knox products.

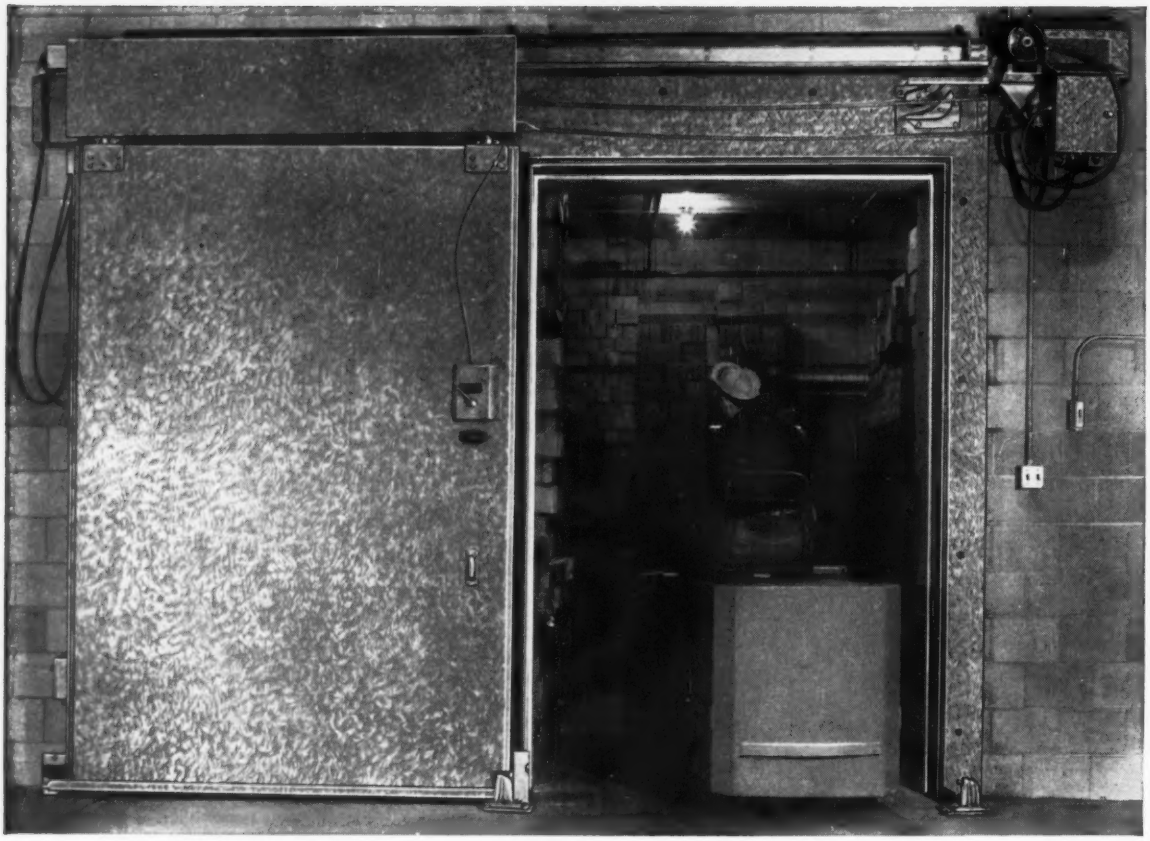
"We take full advantage of Knox's quality and clarity by hand-packing our olives in patterns that give maximum package attractiveness. We've found that this, plus proper display in the store, can increase a grocer's olive sales by ten to fifteen percent."

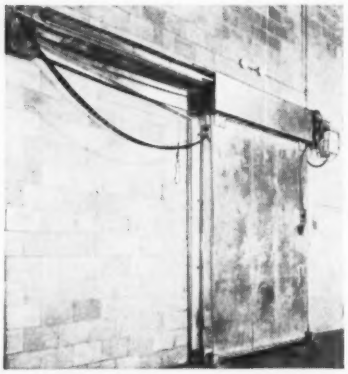
*Name available on request.

The manager of the same company's pickle department says: "In modern supermarkets, the product has to sell itself. That's why we use glass—to take advantage of impulse buying. Knox's quality glass can take the strain of the packing process—including the thermal shock of pasteurizing—and still give us the best available sales package."

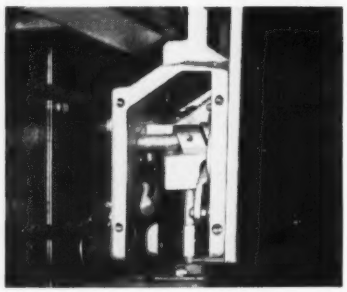
Find out how Knox's quality product, reliable delivery, and outstanding service can play an important role in increasing your sales by furnishing the package with maximum shelf-impact. Contact Knox Glass, Inc., Knox, Pa., or any one of Knox's 37 sales offices.

the new / **KNOX GLASS**





FAST OPERATION of Electroglide Freezer Door saves refrigeration. Note Jamison Frostop® installed to prevent icing and freezing.



POSITIVE SEAL. When door reaches closed position, exclusive Jamison camming action forces door *in* and *down*.

Photos Courtesy: National Tea Company,
Council Oak Stores, Sioux City, Iowa
Insulator: Low Temp Insulations, Omaha, Nebraska

In-and-out freezer room traffic speeded up by Jamison Electroglide® Doors

The efficiency and economy of Jamison's new Electroglide Power Operated Door are assured by special Electroglide features—available in no other door.

RANGE OF TYPES—Available as bi-parting and single leaf right or left hand.

LEVEL RIDE—Door opens and closes without gasket drag or wear.

SAFETY—Full height safety edge reverses door instantly on contact.

EMERGENCY CONTROLS—Manual operation when power off; emergency release from inside when padlocked outside.

Get the complete story on Electroglide Cooler and Freezer Doors. Write today for new bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

VACUUM DRYER takes moisture out of bouillon base at low temperature to protect quality. Plastic trays are used so material won't stick to them.

Principles of Soup

"Soup should not replace the meal and cause a feeling of satiation. Its composition and its flavor should make the consumer well-disposed toward the excellence of the following courses. At the same time, it should put the palate and the stomach into a state of readiness and receptiveness for the meal that follows."—Knorr

Sells Swiss Soups to World

Knorr improves taste through science. Introduces advanced production techniques. Automates protective packaging. And applies meticulous quality control

TO MAKE truly delicious soups is both an ambition and a tradition among cooks throughout Switzerland —where a lunch or a supper is not complete without this hearty appetizer.

It is not surprising, then, that gourmet-quality dry soup mixes and bases are made by Knorr Food Products Co., Ltd., Thayngen, Switzerland (now owned by Corn Products Co., New York).

"The soups that make Swiss food famous" is not an empty slogan. The quality is really there, and the products are popular in many countries around the world. That's why sales increased seven-fold in four postwar years.

Process Improvements

What may surprise those who have not seen the Knorr plant are the advanced and unique processing and packaging methods and modern factory facilities.

Bouillon base is dehydrated at a cool 120-140 deg. F. under a vacuum of 20 to 40 mm. in a shelf-type cabinet, 2,400 lb. per batch. Polyvinyl chloride trays, about 3 ft. long and 1 ft. wide, contain the mix in the dryer. There are 16 rows of them 5 trays to a row. Why PVC trays? The product does not stick to them after its moisture content is reduced from 30% to 1 to 3% during the 2 to 3-hr. drying period.

There are more economical ways to dry mixes, but none, short of freeze-drying, so well protects the quality.

Flour is dehydrated at a rate of 1,340 to 1,760 lb. per hour in a "whirlwind" unit designed by Knorr. Fed in by gravity chute, the flour is caught in a blast of hot air which drops the moisture content from 14 to 2% before air and flour discharge into a cyclone separator. The heated air enters the dryer at one side below center and passes up through a horizontal screen located below the end of the flour chute and spreader cone. For safety's sake, a 24-in. dia. explosion tube extends from one side of the dryer through an outside wall.

Pressure-cooked chicken is deboned in an ingenious and efficient device developed by Knorr. It is a hydraulic press with a nylon piston operating inside a 10-in. vertical stainless steel cylinder with 2-mm. holes that taper outward in its sides. Meat on the bones is pressed under a force of 500 lb. per sq. cm. between the piston and a nylon block at the bottom of the cylinder. Forced from the squashed bones, the meat is extruded outward through the holes and is caught in a pan surrounding the cylinder. About 2 ft. tall, the perforated cylinder flares outward in two stages to a final bottom diameter of about 12 in.

From 440 to 880 lb. per hour of chicken can be deboned per operator with this press. And loss of meat is only 1 to 3%, which is better than can be achieved with laborious and costly manual deboning.

This press has two cylinders, which are alternately rotated into position under the piston so that one unit can be emptied and refilled while the other is in operation. And the nylon block at the base of the extrusion cylinder lifts hydralically to free the pressed bone-cake, which is put into feed.

Meat used in the soups is prepared for processing by a screw extruder that forces it through holes

FRANK K. LAWLER
Editor, "Food Engineering"

PHOTOELECTRIC color sorter rejects off-color grains of rice with compressed air blast.

WHIRLWIND DEHYDRATER developed by Knorr feeds flour in at top, hot air at bottom and discharges into cyclone. The low-moisture flour is then bagged. Large duct at right is explosion vent.

in a plate. Drums of fat are melted by a steam cylinder that is lowered by pulleys, the unit being equipped with an agitator.

Two advanced electronic inspection devices are used as part of the plant's rigid quality control. One is an electronic color sorter with two continuous belts that form a "V" and carry the material past a photoelectric eye. Off-color particles are rejected by a quick blast of compressed air. When the author visited the factory, this was being used experimentally to sort rice.

The other electronic device is a metal detector. It stops the product conveyor automatically and reverses the belt until the offending piece of metal is opposite a discharge chute. Then the operator scrapes the product off the belt at that point.

Flavor Upgraded

The rapid increase in sales after World War II was triggered by a significant improvement in quality. Freedom from "factory taste" and elimination of the monotonous "brown seasoning" (or soup base) was achieved by extracting amino acids to produce pure seasoning with a "clean," zestful taste. No undesirable substances remain to impair flavor and aroma. The same principle of manufacture was applied to Knorr's bouillons.

To protect the fine new quality, the pliofilm-lined aluminum pouch was adopted to keep out air, moisture, light, and foreign odors.

Reputation Spreads

But Knorr made another basic improvement that greatly enhanced product acceptance. It reduced cooking time of its soup mixes (where cooking is required) to 5 min., adapting them to "the requirements of modern time." This, of course, is done by precooking.

Having achieved a new gourmet quality, the company sent samples to the heads of large buyers' unions and coops, and to wholesalers and retailers that they might try the products. They did. And the news that Knorr had delicious soups spread quickly.

Advertising to educate consumers about the products and their qualities followed, supplemented by distribution of samples to homes and tasting demonstrations in stores and at fairs.

Make it good, and let them try it. That was the basic formula of Knorr's phenomenal postwar success.

Rigid Quality Control

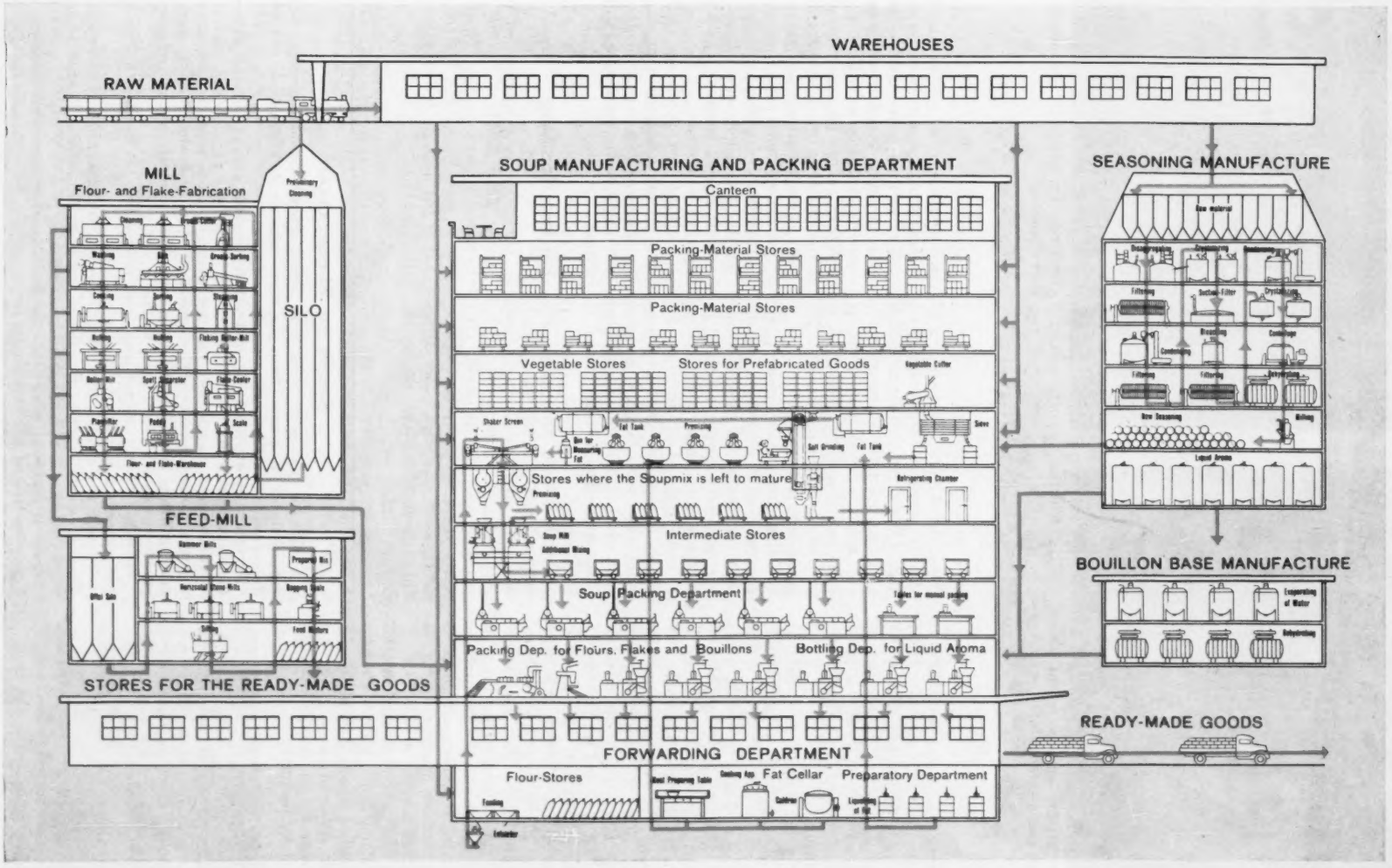
But no matter how good the formula, the soups couldn't be tops in taste if Knorr did not carefully select raw materials from many countries (including the U.S.), inspect them closely, process them carefully, and taste-check every batch.

Science plays a fundamental role at every step to assure purity and to enhance and protect flavor and shelf-life. Sixteen people work in the plant's well-equipped quality control and research laboratories. And others operate a test kitchen. Every material must be tested by taste and by lab.

A key operation quality-wise is the preparation of seasoning and bouillons, so important in tailoring soups to the modern taste trend. It takes 10 days to make the seasoning from the wheat grain. And this seasoning, together with the meat extract, serves as the base for all the soups.

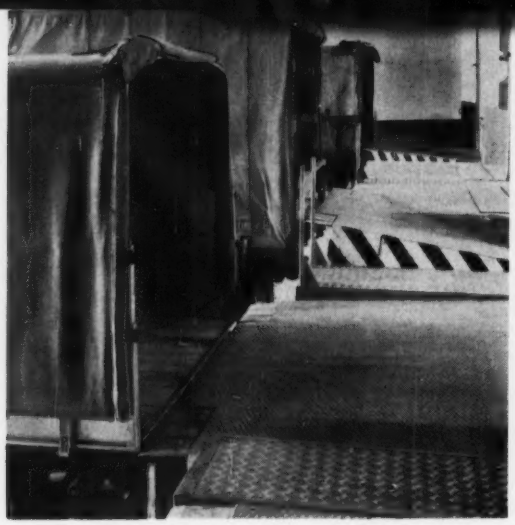
Of special importance, too, is the preparation of the fat. Extract of

EFFICIENT PACKAGING in envelopes is achieved in fast filler, former, sealer. Manual cartoning (right) is to be replaced by a machine.



IT'S A BIG OPERATION that Knorr has built on quality at Thayngen. And it's modern and efficient, too. This schematic diagram, with equipment and flow lines depicted, tells the story

LIFT TRUCK quickly moves pallet load of finished product cases into delivery vehicle.



HYDRAULIC RAMPS that lift and push outward level with truck bed speed loading.

vegetables and spices are added to quality-tested fat, and the fat is sterilized to destroy any bacteria that might be present. Overheating of fats is carefully avoided, and their taste and odor are under strict chemical control.

After the various raw materials have been properly prepared, they are taken to the blending department. Soup-flours, seasoning, spices, fat, beef-extract, and vegetables are accurately measured and blended in 625 lb. bowl mixers with double arm-action of the type often used by bakers. Fat is pressure sprayed through fine jets into the mixer, at controlled time and temperature.

After preparation, the basic mixes are stored 2 or 3 days in bulk nylon bags to allow flavor to "mature." After that the mixes are finely milled to prevent lumping. Then the more bulky ingredients, like noodles and dehydrated vegetables, are added in a final blending operation by ribbon-type spiral mixers.

The final mix is scooped into filling machine chutes because mechanical handling causes separation.

Every batch of mix is tested in a kitchen on the mix floor before being released for packaging.

Fast Packaging

Quality-protecting and attractive pliofilm-lined aluminum foil envelopes carry Knorr's dry soup mixes to its world-wide markets. And these are formed, filled and heat-sealed on efficient automatic machines developed by teaming the ingenuity of Knorr engineers with the know-how of European machine fabricators.

Feeding from a roll, the packaging material folds double over a V-shaped former and is heat-sealed between labels in continuous motion to make pouches. These are then cut apart, opened with plungers, filled by volumetric measurement, and heat-sealed at the top—at a 140 per minute rate.

Discharging onto a conveyor belt, the soup packets are stacked into display cartons by six girls. The cartons are overwrapped and sealed by two girls. That the manual operation is to be replaced by cartoning machines is testimony that no opportunity for top efficiency is being overlooked—though the cost of labor is not more than a fourth of that in the U. S.

Bouillon cubes are formed and wrapped at a 130 per minute rate. Machines compress the ingredients into molds on a rotating plate after inserting foil into the molds. Another operation folds the wrapper neatly over each cube, cam action forces the cubes from the molds, and a mechanical arm pushes the cubes onto a conveyor belt. As they collect in rows of seven on a metal plate, a pusher slides the cubes onto wood trays that go to a cooler.

Cooled cubes feed in single file into a machine that inserts them in pairs into small cartons, 200 per min. —and 200 million a year.

Paperboard shipping cases for export to other European countries are wire bound by machine, 3,000 per hour, with two operators.

Prepared ingredients are chuted into polyethylene-lined fiber drums for shipment to a French plant. In this operation fast air-operated valves cut off the flow.

Efficient Handling

For quick, easy handling of materials, Knorr combines pneumatic conveying, pumps, gravity flow from top to lower floors and lift trucks. And it has unusual devices to speed truck loading.

Arctic to Madagascar

A taste for good soup seems to be almost universal among peoples. Knorr reports theirs in demand from the Arctic regions to Madagascar, and from Singapore to San Francisco.

French housewives, who at first called prepared soups "infecte," now use them enthusiastically.

Italian cooks traditionally frowned on ready-made products. But they're enjoying the Swiss-made mixes, especially clear beef and chicken, used in making risotto and minestrone. In fact, these products are heaven sent to people who cannot afford meat-broth.

Belgians formerly omitted soup from their menu, yet Belgium has become "an interesting market" for Knorr products.

And so it goes. People like them in Sweden, Portugal, England and Canada. They are bought in the Belgian Congo and many countries of Central America —not only by whites but by natives as well.

Knorr is especially proud that its products have successfully invaded the U. S.—the land of fine commercial soups.

TWO LABORATORIES like this apply scientific control to quality of ingredients and finished products.

CAREFUL INSPECTION of dehydrated vegetables on moving belts is part of Knorr's ingredient control.

When a truck backs up to the loading dock, it breaks a light beam to actuate a photocell that signals the driver when to stop. Then a hydraulically operated steel loading ramp, controlled from a pushbutton console, raises to truck bed height and pushes outward to close the gap between dock and truck. The ramp also lifts at the rear end when bags are to be loaded. This puts it at pallet height for easy movement of bags into the vehicle by hand truck.

Another time-saver is electric door operation in the plant, via pressure bars in the floor. An employee on foot steps on one end of the bar and the sliding door opens halfway. But a lift truck depresses both ends to open the door fully. Door closing is similarly automated.

Automatic Fire Signals

To guard against disaster by fire, not only do fire walls sectionalize the factory, but novel alarm devices are installed. Ionization fume detectors, located on ceilings throughout the factory, will actuate visual and sound alarm signals on panels in the factory and the boilerhouse. And panel lights indicate the exact location of the fire.

What's even more unique, the system signals off-duty members of the plant's fire-fighting crew. This is achieved by transmission of electric impulses over the utility wires to "little black boxes" in workers' homes. And within 5 min., the men are at the factory. Forty employees are trained to fight fires.

CO_2 fire-smothering system is installed in the basement where there is much electrical equipment. And temperature as well as ionization detectors are used here. To permit employees to evacuate, there is a 10-sec. delay, after the alarm, before the gas is automatically released.

Color Dynamics Pay Off

Erected by voluntary employee contributions, there stands on Knorr's front lawn a large stained-glass panel depicting workers in action. This is in appreciation of management's keen interest in its people and close attention to their comfort and welfare. It signifies an attitude that assures careful and efficient job performance.

To make the plant a pleasant place to work, scientifically selected combinations of cheerful colors are painted on walls, ceilings and machines. And an important secondary effect of such color dynamics is good worker productivity.

"The human being is used to the colors of nature . . . and it would be a crime against nature to place him for his daily work into a dulling monotony of white, green or gray."

Large window areas contribute to the pleasant atmosphere as well as providing efficiency illumination.

Particular character is given to each floor by a different use of pastel yellow, yellow-green, and blue, along with reddish brown. Some plane surfaces are white, as are ducts, pipes, and chutes for material flow.

Situated atop the 10-story factory, an attractive employee canteen with a scenic view makes for relaxing and refreshing, lunch periods. Here the girls linger to talk, or to bask in the sun in comfortable terrace chairs. They return to work with refreshed energy.

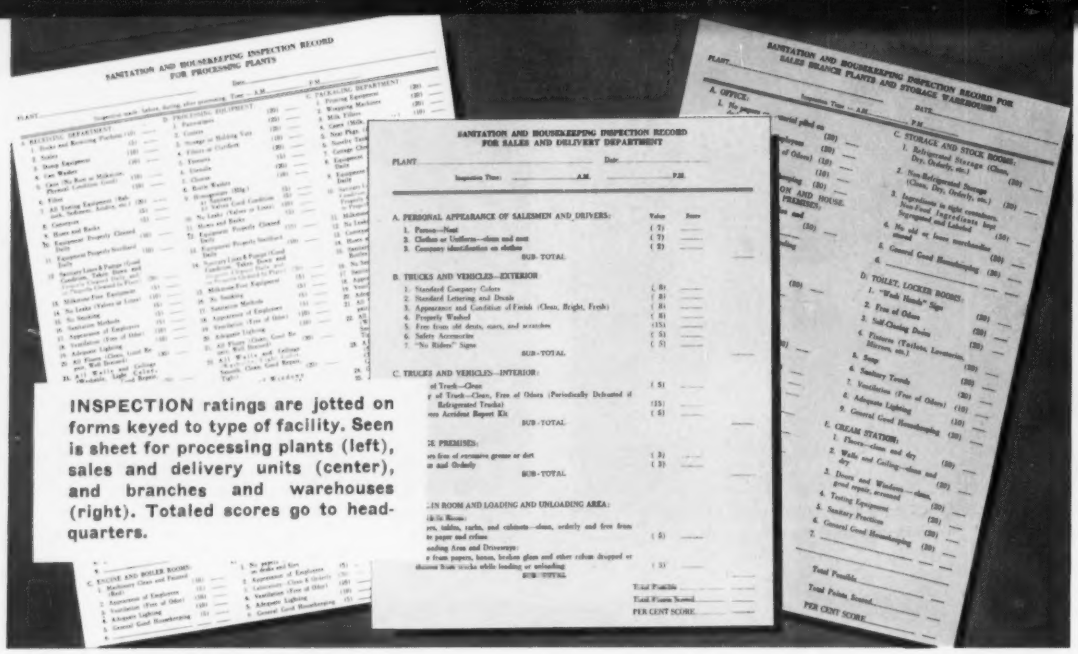
Knorr's line of pouch-packed soups includes tomato, leek, mushroom, asparagus, Florida spring vegetable, onion, ham-flavored green pea, oxtail, cauliflower, chicken noodle, and egg drop. The firm produces foil wrapped cubes of clear chicken and beef soup mixes, and a gravy mix in cubes.

Knorr also has developed a modern general-purpose kitchen seasoning, called Aroma. It is produced in the form of little cubes, 6 to a packet, and as a powder in a shaker container. The firm also makes porridge oats, special flours (pea, spelt, bread crumb, potato, roasted wheat), tapioca, pearl sago, phosphate (flour base) baby food, as well as oat, barley, rice and millet gruel for babies.

Spelt flour is made from unripe wheat grains, specially prepared,

Continued on p. 45

FE'S EDITOR Frank Lawler discusses Knorr's fine employee relations with Plant Manager Dr. Grandenberger as they stand in front of the stained-glass panel donated by employees in appreciation of management's fine attitude toward workers.


SANITATION AND HOUSEKEEPING INSPECTION RECORD FOR PROCESSING PLANTS
SANITATION AND HOUSEKEEPING INSPECTION RECORD FOR SALES AND DELIVERY DEPARTMENT
SANITATION AND HOUSEKEEPING INSPECTION RECORD FOR SALES BRANCH PLANTS AND STORAGE WAREHOUSES
INSPECTION ratings are jotted on forms keyed to type of facility. Seen is sheet for processing plants (left), sales and delivery units (center), and branches and warehouses (right). Totaled scores go to headquarters.

Gaging performance on these exacting score sheets . . .

'Sanitary Sams' Win Top

Special-inspector system promotes high sanitation consciousness, with competitive features spurring workers into team action to win plaques . . . Many extra benefits cited.

EMPHASIS on sanitation has been basic policy at Beatrice ever since the beginning of the company back in 1898.

Then, as now, there was clear recognition that the quality of dairy products depended not alone on production excellence, but on sanitation excellence, as well.

As the company expanded, the responsibility of safeguarding sanitation standards was delegated to plant personnel, specifically sanitarians, who reported to the plant managers. Employees got specific pointers on plant sanitation and good housekeeping techniques. Overseeing the whole program, and directly responsible to the company president, was the director of quality control.

Purpose of the program was to insure that all responsible personnel were aware of the importance of sound sanitary practices—and followed them.

This system worked well until growth of operations made direct control impractical. Simply maintaining standards at the level of regulatory agency requirements was not enough. We wanted more—much more.

We wanted to continue making improvements until we were satisfied that we had achieved and could maintain—the most sanitary food plants in the country. In the '40s, the problem was somewhat complicated by the rapid wartime turnover of personnel. Because of lack of knowledge of sanitation responsibilities on the part of new personnel, and insufficient time for training, there was danger of the company's standards suffering.

Birth of "Sanitary Sam"

Out of that critical need, our new program was born. We enlisted the services of 20 thoroughly qualified and unbiased specialists, not in any way connected with Beatrice Foods, to make at least two unannounced inspections of every plant and branch each year. These specialists, chosen from the faculties of prominent agricultural colleges and universities, were experienced in both the theory and practice of good dairy plant operation.

"Sanitary Sam," as they dubbed the endeavor, became the popular nickname of the company-wide program.

In their twice-yearly unannounced inspection visits, these dairy-sanitation specialists tabulate their findings as mathematical scores. At first, the passing mark was 75. But this was later raised to a much more demanding 90. The scores were based on the percentage of sanitary perfection in each plant after a study of conditions throughout the plant.

All departments were covered in the inspections—receiving, processing, packaging, storage, offices, washrooms, locker rooms, engine rooms, and the exterior of the premises. Scored, too, was personal appearance of employees. Also the condition of company trucks.

When a "Sanitary Sam" makes a plant sanitation and housekeeping inspection, he takes along three score

G. W. SHADWICK and GORDON HOBBS

Respectively, Director of Quality Control and Chief Engineer, Beatrice Foods Co., Chicago

STRONG INCENTIVE in program is coveted "Superior Sanitation Award". Here, it is being received by Manager Doyle Padgett (right) of Beatrice's Jasper, Ind., branch. Making presentation is Manager S. L. Risch, of company's Tip Top Creamery Div., Vincennes, Ind.

Housekeeping at Beatrice

sheets (see illustration). One is for processing plants, one for sales branches and storage warehouses, and one for sales and delivery departments. After the inspection, a total sanitation score is computed and sent to the general offices.

A third inspection sometimes is made during the year, particularly if a plant's score dropped slightly in the previous inspection. When a plant fails to achieve the minimum passing grade, personal visits are made by representatives of the Beatrice Foods quality control laboratory and engineering department, to determine the problems and help eliminate them.

Occasionally, the 20 "Sanitary Sams" meet to discuss procedures and suggest means of improving the overall program. Constant progress thus is realized.

Incentive Program

To get the program off the ground at its inception in 1945, an incentive system was devised, based on the "Sanitary Sam" inspection score, which reflected the cooperation of all plant personnel. Listed and displayed was a line of prizes for all personnel in winning plants, with these awards to be made on a system of points—the more points, the more valuable the prizes given winners.

Regardless of his duties in the plant, every employee received the same number of points, based on the plant-inspection score. As a result, poor sanitation practices in any department, or on the part of any personnel, would reflect directly on the value of the prizes received by all. Naturally, sanitation efforts became a collective concern, with employees imposing discipline on each other to raise the overall score.

80...92...and Now 94%!

Average sanitation score of the Beatrice plants was 80% at the outset of the program in 1945. By '53, the figure had risen to 92. And today the plants have chalked up a striking 94-plus.

Individual plants scoring 95 or better get "Superior Sanitation Awards," and most impressive is the fact that some plants have been consecutive winners.

As for the passing score of 90, 6 plants have maintained this high level for 12 yr., 30 have kept it for 7 yr. or more, and 47 have scored it for 2 to 6 yr.

A simple, well-illustrated training manual was issued to all new personnel, instructing each employee on his specific job and detailing sanitation techniques in all phases of plant operation.

For additional promotion, lively color posters were put up on bulletin boards and near work areas. Here, a contribution was made by a cartoon character named "Dizzy Du Rong," who illustrated bad examples to help employees "duright." He was originated in one plant by the workers themselves, then reproduced for bulletin-board use in other plants.

A few years after the war ended, the prize-incentive feature was figured to have done its job. It was then discontinued, since personnel turnover was greatly reduced and employees had been thoroughly trained in sanitary procedure.

High standards of sanitation have now been completely incorporated into our operations, to form a part of the regular duty and responsibility of everyone in the company.

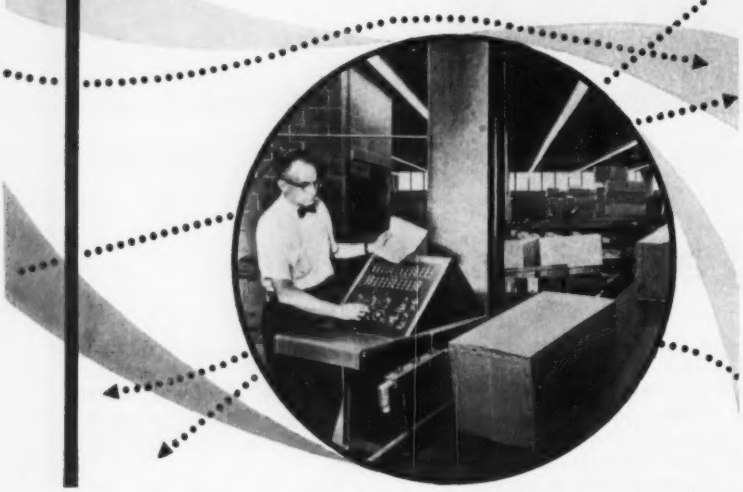
Plaque Award

Today, a beautiful copper-and-wood wall plaque—The Superior Sanitation Award—goes to plants which

(*Continued on next page*)

MECHANIZE... PROFIT-WISE!

WITH LAMSON ENGINEERED CONVEYOR SYSTEMS



One man at Master Control Panel regulates the network of engineered conveyors.

You cut production time and the unnecessary handling of materials to the bone with the help of LAMSON engineers. They are specialists in developing materials handling systems that truly increase the capacity of your present buildings and dramatically increase the productivity of your present equipment.

There are more LAMSON custom engineered conveyor systems in successful operation today than any other kind. They are being serviced throughout their life by the same LAMSON field offices that initially analyzed the problem, proposed the solution and supervised the installation.

As a result of this complete, professional service you will find many of the finest names in industry among LAMSON installations. During the past 75 years LAMSON has been active in almost every field, yours included, and perhaps even in divisions of your own firm. LAMSON can cut costs; speed production; increase your profits.

If you have a materials handling problem, write LAMSON today for our conveyor catalog and the name of your nearest LAMSON Field Engineer. Or, simply clip this advertisement to your letterhead and mail to:

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meet the exceptionally high standards of the program. President William G. Karnes announces these awards in an annual message. Those plants rating 95% or higher are listed, and are presented their plaques at annual dinners. A winning plant must maintain its 95% rating to retain possession of the plaque.

For a supplementary check, a representative of the American Sanitation Institute, Division of The Hugé Co., inspects each plant semi-annually. With consistently high scores in these inspections, a plant earns the Institute's Award of Excellence, a framed display certificate.

Basically, the "Sanitary Sam" program aimed for better sanitation than was possible with a conventional system. This it has achieved—and more. Among additional benefits are:

- ▶ Maintenance of product-quality control at higher levels.
- ▶ Plants now operate more efficiently.
- ▶ Employee morale is at a new high.
- ▶ An inter-plant competitive spirit has been initiated.
- ▶ Beatrice operations are now more economical as a result of a better safety and preventive-maintenance practices.
- ▶ The program also has gained community and industry recognition.

It's to be noted that this outstanding program has now been adopted by many others—such as Beatrice's non-dairy facilities and plants of other food companies.

We at Beatrice Foods cite this continuous sanitation program as thorough, exhaustive in scope, and notably critical to the most minute detail. —*End*

"You've got a superior product there. It has an A-1 reputation. Your price is right. And yours is a good, reliable firm. However, business is business—so I'm placing my order with my son-in-law who works for your competitor."

Low-Cost Food Marketer Upsets Paris Traditions

Idea catches on with irresistible force. Gets official support

EVEN IN FRANCE'S tradition-bound economy, the old way of marketing food is breaking up under new pressures. [And the changes will make it easier for American marketers to build business in that part of the world.—Editor.]

French supermarkets already are beginning to spring up in Paris suburban areas. Two are in full swing right now, with more on the way. A U.S. supermarket outfit is seriously considering laying down a string of 22 outlets throughout France.

But perhaps the most fascinating development is the price-cutting retail food operation being exploited by a 33-yr.-old man from Brittany, Edouard LeClerc. Within the past two years, LeClerc has suddenly blossomed into a national personality. Retail outlets bearing his name, only two of which he owns himself, have spread throughout 60 selling points in France.

Recently, LeClerc made his boldest move: He held a press conference in a suburban cafe to announce the opening of the 61st LeClerc distribution center, the first for the Paris area.

Irate local grocers stormed into the cafe and broke up the meeting. But down the street LeClerc's Paris invasion was well underway. French housewives, irked at rising retail prices, lined the street outside LeClerc's new store. Headlined one Parisian newspaper the next morning:

"LeClerc Captures Paris"

Obviously, LeClerc still has a long way to go before he can claim a major victory over Paris' high-cost distribution system. But his short-circuit retail gimmick has already made him the most-talked about retailer in France.

LeClerc's method of operation is simple. He buys nationally-advertised food brands, directly from the producer, and sells at wholesale prices (8 to 10% markup). His costs average 6%, giving him a profit of 2 to 4%. Eliminated is the retail markup, generally 18 to 20%.

The average retailer's profit margin is about 3%, roughly the same as LeClerc's. But a single LeClerc store does more business in one day than the average French retail grocer does in two weeks.

LeClerc's avowed aim is to slash the cost-of-living, using his own stores as a sort of flying wedge, and he is attacking the Parisian stronghold at government request. The government's so-far-successful economic program is being nibbled at by rising retail prices. So last year a new law was passed to forbid manufacturers to withhold their goods from such retail operators as LeClerc.

Backed by this kind of support, LeClerc plans to stake out 22 retail outlets throughout Paris. His stores are plain, for in his opinion flashy places are not needed to sell national brands.—*End*

ROBERT E. FARRELL

FE Correspondent,
McGraw-Hill World News, Paris

Sells Swiss Soups to World

(*Continued from page 41*)

milled, and kiln dried. Of savory taste and highly nutritious, it is used principally in soups.

Knorr was producing special flours for feeding babies and for kitchen use in 1885. Later it mixed various flours with dehydrated vegetables to make prepared soup mixes. First and long famous in Europe was Knorr Erbswurst, a green pea mix pressed in the form of sausage. This was popularly dubbed "Knorr's sausage."

Now employing 1,000 people, the Thayngen operation includes a 10-story soup plant, 7-story flour and flake mill, 3-story feed mill, 7-story seasoning plant, 2-story bouillon base factory and raw-material and finished goods warehouses, as well as office space (see flow diagram).

Three floors were added to the soup building 5 yr. ago to keep capacity in line with the growing business. More space was constructed only a year ago, and an expansion wall indicates future intentions to produce still more Swiss soups for the world, including the U.S.—*End*

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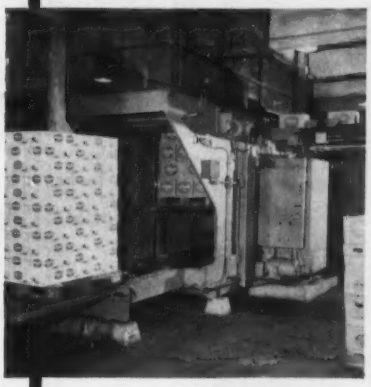

Gauged to handle any flow

Designed logically to receive the stepped-up mechanized flow of packaged goods from high speed production lines, the LAMSON AUTOMATIC PALLET LOADER provides the perfect link between packaging and warehousing.

Fast, accurate and dependable, the LAMSON AUTOMATIC PALLET LOADER performs a complex and variable operation for long periods of time with minimum maintenance.

Initial cost may be amortized out of savings the LAMSON AUTOMATIC PALLET LOADER effects in reducing man hours per pallet load and damage or breakage to packages.

Write for THE AUTOMATIC PALLET LOADER catalog. It may well be the answer to your particular materials handling problem. Or, simply clip this advertisement to your letterhead and mail to:

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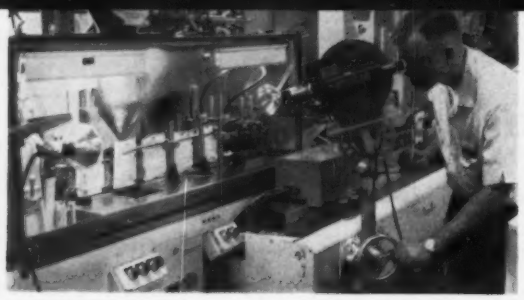

TROUBLE SPOTS on lines are pinpointed for quick correction by high-speed movie camera. Checked here is instant-potato packet operation.

FREIGHT DAMAGE in RR car is snapped. Film evidence aids in reducing employee carelessness, also in fighting legal battles.

Cameras Up Operating Efficiency

R. T. French focuses them on tough production-line and shipping problems—thus chalks up solid savings in costs and man-hours

PUTTING PHOTOGRAPHY into your operations can win you plenty of extra dividends—and in more than just advertising and publicity performance.

In addition, cameras can play vital plant roles in stepping up your production and shipping efficiency.

In point is the case of the enterprising R. T. French Co., well-known Rochester, N. Y., maker of spices, condiments, instant potatoes, and numerous specialties. The versatile camera equipment it acquired—

- **Solves jam-ups on fast-operating production lines.**
- **Supplies step-by-step pictures of initial machine installations—"visuals" that cut time and trouble in setting up similar units.**
- **Aids management with film proof for fighting legal battles stemming from shipping damages.**
- **Makes "case" shots of faulty shipments for alerting lax loading crews and so improving their routines.**

Where production equipment runs at top performance, traffic jams may develop anywhere on the line. In the case of a mustard-bottling tie-up, trouble-shooters sought in vain for the cause, then called for the company's high-speed motion picture camera. They aimed it at the critical spot, started it whirring, caught a jam on the film—and found the answer.

The camera had 'slowed down' the fast-moving bottles and revealed the troublemakers—bottle edges which were too sharp and were locking together.

A request went to the bottle supplier—"Please bevel off sharp edges." With this done, the line's mustard-bottle tangles were minimized.

A big time-and-money saver is the photo method French applies when installing complex new machinery, such as the unit designed exclusively to package instant potatoes. With this equipment, packets are filled in a nitrogen atmosphere, tested for air tightness and oxygen control, and placed in consumer cartons.

A Polaroid camera recorded every step in setting up and modifying the new unit. These photos were sent on to the next French plant preparing to put in such machinery. Thus, engineers and mechanics got a sharp visual picture of the whole routine to speed and simplify their own installation.

Fights Freight Gremlins

Efficiency goes up and waste comes down when the camera goes to work at the receiving docks. As one of Rochester's largest rail and truck shippers and receivers, French places first importance on condition of its freight.

When opening of a boxcar or truck trailer reveals damaged goods, a camera is hustled to the scene to record the details on the spot. The pictures may have two uses: First, to support possible claims against shippers; second, to refresh the memories of company employees when improper loading at branch plants is indicated.

"There's a right way to load every product we make," says a production superintendent. "When loaded improperly, and damage results, the pictures tell the story—and that story is quickly sent back to those responsible."

Photography also aids in keeping the company's voluminous records and correspondence. Storage space needed is minimized by putting all important paper work on microfilm—one reel of film equal to a full filing-case drawer. For a company that produces hundreds of different items, buys raw materials from hundreds of suppliers, and sells to as many purchasers, rewards in space savings are myriad.

French hires a commercial photographer for much of its publicity and advertising work. Availed test kitchen, studio, and darkroom, he sends preliminary display photos to the company's New York City advertising agency for further development.

Officials are well pleased with this arrangement, which gives the agency a key picture of what the client seeks, thus speeding creation of versions the company will approve. Retakes and deadline conferences are cut extensively.

A special application is making color negatives (Ektacolor film) for use by company salesmen. New products and displays are common subjects. Further, 35 mm. color film is employed to make slides for use at company sales meetings and to illustrate home economist talks.

French, an organization employing 1,500, has put some $13,000 into its photography setup (including darkroom and studio facilities). Working equipment employed includes the Polaroid Land Camera, high-speed Wollensak Fastax motion picture camera, and 8x10 Deardorff view camera. All told, this food maker gets maximum camera benefits with minimum cost in dollars and man-hours. —*End*

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THROTTLED STEAM with its destructive erosive effect on a valve seat . . . hard, seat-cutting substances like rust tubercles, boiler scale, pipe chips . . . such valve destroyers have little or no effect on a Jenkins Bronze Plug Type Valve. Jenkins 500 Brinnell Armor Seat defeats them.

There's much more to the durability of these valves than the seat. Jenkins gives you 17 *other* superior features that contribute to long-life and completely satisfying service. All are important to any valve user who wants maximum economy, and only Jenkins gives you all of them. Send for literature which gives full details about them.

Still more protection against valve repairs comes from superiorities which cannot be seen in any picture of a valve: The quality in the castings . . . the precision machining . . . the rigid inspection and testing which every Jenkins Diamond-marked valve undergoes.

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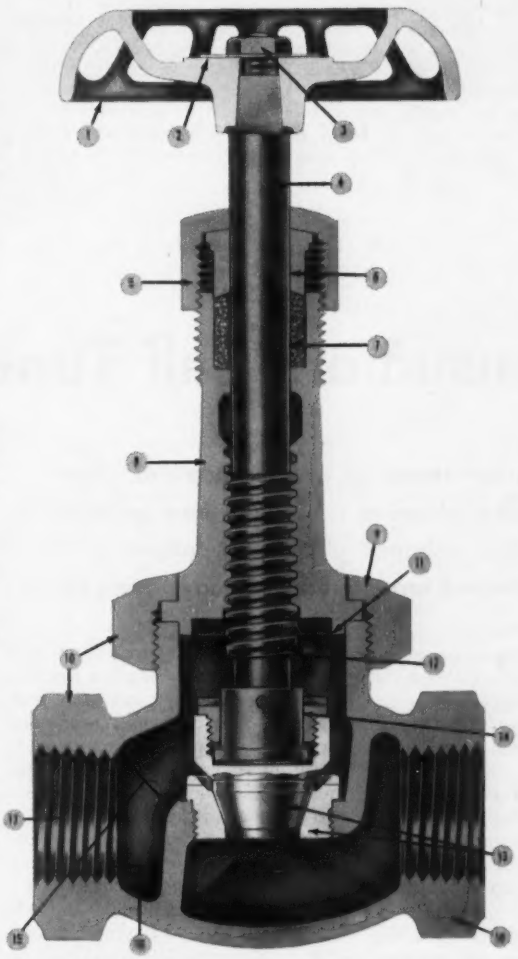

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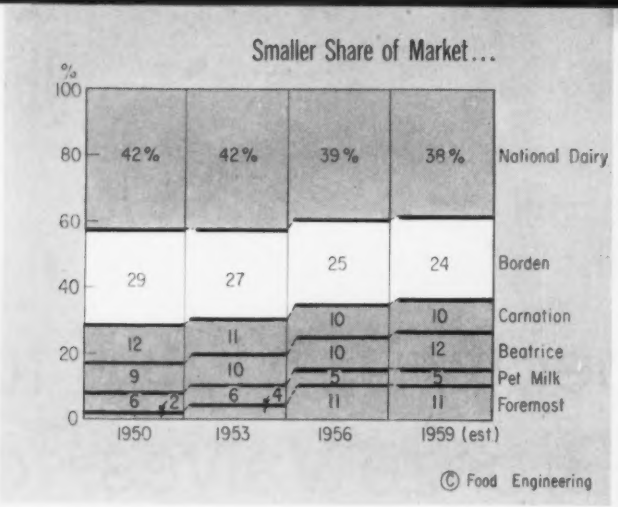
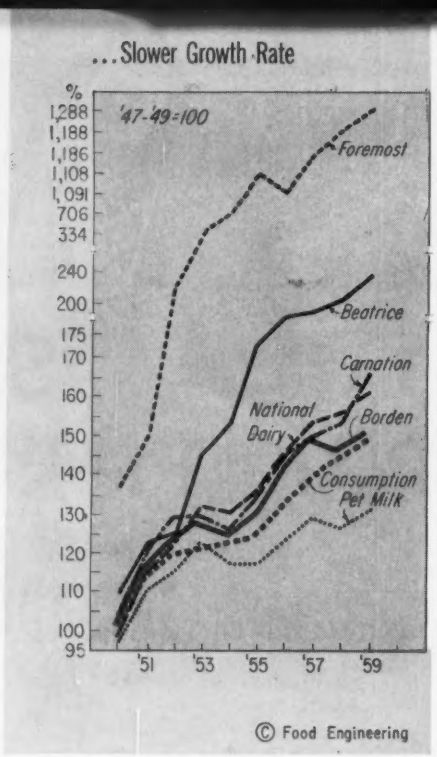




THESE ADVERSE FACTORS during last decade have made Borden strike out for new growth fields. Mergers and product diversification helped Beatrice and Foremost enlarge their market share at expense of National Dairy and Borden, as chart above shows. Also while Borden's sales curve during '50s kept even with rise in food consumption (right), competitors chalked up sharper advances. Only Pet Milk, hurt by trend away from evaporated milk, was unable to keep pace with increased food consumption.

Consumers Call Tune in Borden's

Shifting consumption trends in new decade put stress on shrewder market planning . . . Here's how growth-minded leader has reshaped objectives, policies, and programs in a sweeping face-lift that's already paying off

PATHWAY to success, or pitfall into oblivion—the kind of course the '60s open up for your company depends on how well you navigate the roadblocks of new trends and problems.

While you hear a lot about the opulent life that's ahead, pace-setting firms are realistically gearing their operations to the rigorous, competitive challenge of changing consumer tastes.

You get a good focus on what this tooling-up involves if you examine Borden's top-to-bottom reorganization.

For this firm, known as the nation's No. 1 Milkman, has set its sights on the broader role as No. 1 marketer of convenience foods. And just what it's doing to pull off this marketing gambit—blending together a richer product mix, orienting marketing to the customer, revamping the internal setup, and planning years ahead on operations and research for greater efficiency—contains pointers for your own market planning.

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

True, Borden for some time has had its foot in convenience foods—it was the first one to introduce a retail-size nonfat dry milk, and was one of the first to have an instant coffee. But while the manufactured foods operation has trailed other areas of the business, the company is betting on those same items to spark future growth.

You get a better perspective of Borden's new tack if you project it against the product diversification that's been churning up the dairy field. Giving impetus to this drive are Federal and local regulations that tend to crimp marketing freedom.

For a time, mergers swept the field as bigger outfits brought up regional producers in the quest to build volume. Lately, the drive has been braked by a rash of FTC suits, charging violations of the Clayton Act.

Now the dairies are casting their acquisitive eye further afield. Borden recently entered the fishery area with the purchase of Snow Canning. Beatrice is moving deeper into specialty items, and says it aims to expand in confectionery. And Pet Milk hopes to pick up one or two food firms this year.

Shifting consumer tastes have also led to broader product bases. With per capita consumption of milk and cream products downtrending (354 lb. in '56 to 348 lb. in '59), dairies moved to latch onto the convenience items that mushroomed in postwar years. Pet Milk, hurt by declining popularity of evaporated milk, branched out into frozen fruit pies, claims to be the leader in that field.

Narrow and rigid operating costs for dairy items push the firms into new spheres. In '58, for example, the net for the top six dairy pro-

BROADER PRODUCT IMAGE: Moving fast for supremacy in convenience foods field, Borden Foods sets a fast pace in new item introduction. Marketing V. P. Robert E. Kahl displays a number of the 23 new products and packages which company brought out last year. His policy: "Give each group of consumers exactly what they want if you want to make and sell products at a profit." Result: Earnings up a zippy 3.6% last year.

Strategy for '60s

ducers averaged 2.7%—while packaged food outfits averaged 5.3%, corn processors 6.3%, bakers 2.7%, cereals companies 7.1%, and canners 3.8%.

Diet fads, especially the "fatty foods" issue, have cut into dairy sales, too. In some instances, companies have turned it to their advantage with popular substitutes—per capita consumption of nonfat dry milk in the '48-'59 period boomed from 3.3 lb. to 5.6 lb.

In other cases, though, competitive substitutes have eaten away at volume—the most striking example being butter. While per capita intake sagged from 10.7 lb. in '50 to 8.3 lb. in '59, margarine leapfrogged ahead from 6.1 lb. to 9.2 lb.

Last year's results, however, indicate that the companies have switched their programs to the right track. Total estimated sales for the Big Six (National Dairy, Borden, Beatrice Foods, Foremost, Carnation, and Pet Milk) reached around $3.9 billion in '59, a spanking 5% hike over the previous year.

Borden, itself, though still in the midst of a massive reorganization, upped its sales 3.2%. More significantly, it boosted profits 3.6%—the healthiest rise in 3 yr. and a favorable omen that the company's new marketing approach is already bringing in its first dividends.

Heat's On

Making the changeover to a broader product base puts strains on old working arrangements. To offset those pressures, and gear operations to what's ahead in the new decade, Borden Foods Co., a div. of the Borden Co., has carried out a sweeping overhaul. Key steps involve: (1) Refocusing of corporate objectives, (2) realignment of internal structure, (3) shift to integrated marketing, (4) emphasis on R&D as a growth source, and (5) sharper planning-ahead.

Company goals, according to Robert E. Kahl, marketing v.-p. of Borden Foods Co., have been reoriented from "selling what we make" to "making—and marketing—what will sell at a profit." That's because, he says, "no one in the food industry is satisfied with his present business. Everyone is bent on getting into new fields." And, he points out, this puts the emphasis on giving consumers—and each separate group of consumers—exactly what they want in a product."

Giving this marketing approach greater thrust is a retooling of company operating segments. Aim here has been (1) to update the divisional autonomy that helped Borden's growth in the past, as well as (2) introduce more central control in areas where it's needed to meet new competitive challenges.

Thus, the separate cheese and food products divisions were merged into the Borden Foods Co. since their lines go through the same retail outlets. This similarity of distribution channels makes national planning more feasible. On the other hand, the milk and ice cream division is a separate company because its operations are greatly influenced by local conditions.

A second extensive structural change has seen the realignment of geographical sales divisions, and the creation of new regional units to meet changing market patterns. New consolidated divisions for the west, south, midwest, and central areas group fluid milk, ice cream, cheese, and food products together, except in a few areas where local conditions (broker arrangements and warehouse locations) make consolidation uneconomic.

Borden expects big benefits from

Overhaul gives Borden Foods (1) tighter coordination of sales and services that used to scatter in different directions, (2) stronger selling drive behind each supermarket item.

this face lifting. Overall, it means tighter coordination of sales and services that previously went off in scattered directions, and it puts the entire sales force behind each supermarket product. Also, it gives the newer food lines the strong support of a crack sales force that had built up the company's milk and ice cream business.

At the same time, milk and ice cream managers, more local- than national-oriented, become more aware of the growing importance of market planning and the developing merchandising trends that will effect their future operations.

With supermarkets expected to play a bigger part in Borden's future, the company is tailoring its distribution to fast, low-cost service. Planned here is a network of sales-service centers systematizing order-placing, billing, and shipment of non-perishables (see FE June'59,p48-54).

A tighter rein on mounting shipping and inventory costs is also targeted by closer planning between marketing and distribution departments. After marketing passes on its annual forecasts of what will sell and where, distribution compares the projections against stocks on hand, then sets production schedules.

In addition to the annual forecast, marketing also passes along each month a quarterly projection. This way, distribution, which is in charge of physical handling of goods to the warehouse point, can chart freight and storage patterns at lowest cost.

Know Where You're Going

Each step along Borden's diversification route means the tougher task of carving out gains in new fields against well entrenched competition. To make sure that its firing power is well aimed, the Foods organization has created a marketing department that impels all aspects of marketing strategy – from product planning to sales promotion–toward a common objective: Profitable growth.

The slant on profits was underscored when T. O. Hofman was moved over from general controller of the Borden Co. to Borden Foods president – illustrating Borden's strong conviction that profitable growth hinges on closer tie-in between the financial and marketing arms of the business. This is an arrangement you're likely to see more food companies follow.

Primary functions of the new marketing department include: Keeping on top of the market status of each product, developing short- and long-range strategy, mapping further expansion and diversification through product development or acquisition, and consolidating individual product promotions into an overall program for more effective use of field sales and advertising.

As department head, Kahl is mainly responsible for these areas. He also supervises budgets, sales objectives, and profit performance. And he keeps a running check on items sold in a few local areas of the country (such as mayonnaise and salad dressing on the West Coast) but which could be expanded to the national level. The company's refrigerated coffee ring began as a local item, then was put into national distribution.

Reporting to Kahl on the staff-planning level are four marketing managers–one each for milk-based products (Starlac, Hemo, Dutch chocolate), non-milk-based food products (mince meat, instant potatoes, soluble coffee), cheese and other perishables (sliced, bulk, spreads, gelatin salads, refrigerated biscuits), and industrial-institutional foods.

Providing the "driving force" behind their respective products, these men develop all phases of marketing strategy–including budget, sales, and profit objectives; selling prices, product and package development.

Also, they submit to the general sales manager, by each Aug. 15, outlines of plans and promotion for the coming year. Liaison is maintained with the GSM and advertising director to assure execution of all marketing plans and their introduction to the in-field sales organization.

To keep their strategy flexible in accord with today's fast tempo, each manager sets aside special merchandising funds, which are then available to field selling groups when needed to take advantage of local opportunities. The budget is turned over to the GSM for district and division use.

The institutional manager handles all items sold nationally to institutional and industrial users. Unlike the other marketing managers, he can go ahead on his own in developing new products, because of the specialized nature of his field.

Kahl also gets direct reports from a new-product planning manager and four line executives–director of advertising and sales promotion, v.-p. private labels and bulk sales, marketing research manager, and general sales manager.

The ad director recommends to each marketing manager the advertsing and sales promotion plans for use in the basic product program, creates all advertising material and sales aids, and establishes budgets (with concurrence of marketing manager). However, he's not responsible for the local products being handled by the divisional v.-p's.

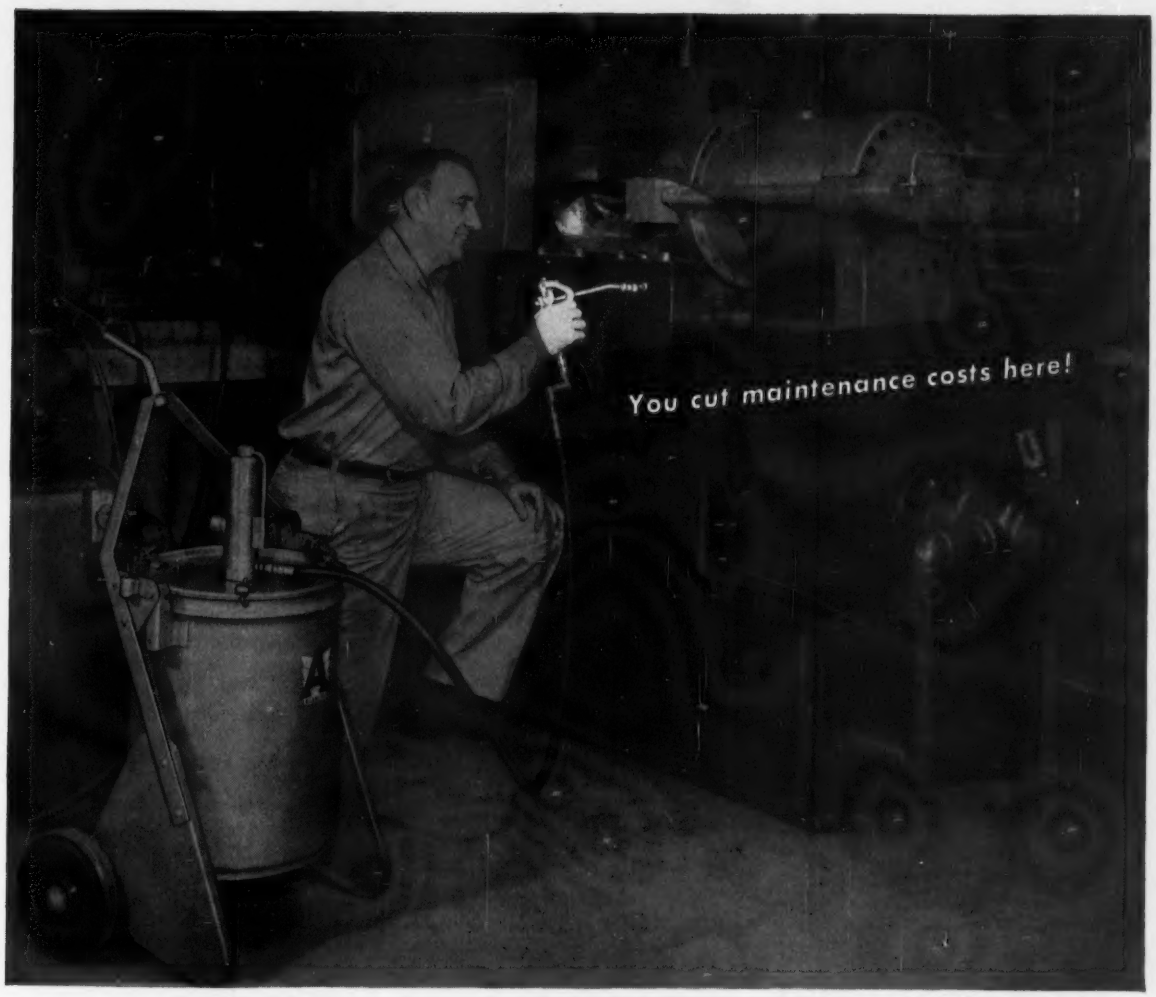
The marketing department's point-of-contact with the district managers and division v.-p.'s on field sales is the GSM. That official advises marketing managers on probable sales effectiveness of proposed strategy, transmits product promotion programs to field sales organization, consolidates all product promotions into a workable overall schedule, and maintains high-level contact with major buyers.

Where sales districts haven't been consolidated into the new divisions, the GSM supervises the district managers and provides the essential elements for manpower development programs. Also, he's in charge of the attainment of sales and expense objectives in all districts.

Putting PLs Under Control

Like other food firms, this Borden div. does considerable packing for private label accounts. Reason is to keep built-up plants operating at near-peak capacity, especially during off-seasons, to keep unit costs down.

However, while this may help on the production end, it can hurt a company's sales. For, as many firms have ruefully learned, where there's lack of a policy guide line, extra aggressive pricing of the PL output makes things rougher for the company's own brand. (Turn to p. 52)



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Borden hopes to cut down this in-bred competition with a two-phased approach: First, each marketing manager will develop the PL policy—including prices—for his own products. Then, as policy is approved by Kahl, it is given to private-labels v.-p.

He in turn will carry it out through his regular sales channels—namely, the GSM, division v.-p.'s, and district and area sales managers. However, on certain big volume accounts with whom he deals directly, he'll by-pass the channels in executing policy.

Creation of the two manager posts for new product planning and market research illustrate vividly two of the most vital aspects of Borden's planning-ahead. As Kahl sees it, they are two sides of the same coin—consumer-oriented products that will sell at a profit.

Future new product plans call for adding existing items that fit into present company lines, entry into already established product fields either by bringing out a Borden brand (as instant potatoes) or acquiring a brand franchise (as purchase of Snow Canning), and development of entirely new items (through R&D work or buying ideas developed by others).

This phase is headed by the new-product planning manager. His responsibilities: To coordinate marketing department's work with corporate R&D segment on new items, to search for products and companies that look like good acquisition prospects, and to pull together marketing department activities for furthering growth of new subsidiaries.

As you can see, acquisition remains an important part of Borden's planning-ahead. However there's one big difference — formerly it was pushed to expand volume, now it's aimed at broader product marketing.

Of course, the company isn't overlooking any bets with present lines, either. Bigger total markets will be sought by stimulating greater consumer usage through improvements in products (such as the new 3-lb. Super Starlac, with which the company hopes to regain first place in the nonfat dry milk field from Carnation). And the same with packages (as the pop-open biscuit container).

Buys More Insurance

Broadening the product line has led to stepped-up R&D works as a check to see that each step is in the right direction. Research budgets the past two years have been at all-time highs, and all signs point to another record-breaker in '60. Pres. Comfort calls it "a low-cost premium for a valuable insurance policy."

In the Borden Foods Co., market research helps the new product planning program at these stages:

▶ **Locating product development opportunities,** especially by spotting points of consumer dissatisfaction with established products. These denote market "vacuums." And Borden figures it can fill them by properly styling items to eliminate the sources of dislike. For example, Borden introduced instant potatoes in flake form after its factfinders reported that consumers were unhappy with powdery versions.

▶ **Drawing up product specifications,** which is done before formal R&D work begins. This outlines what consumers object to in present products, and what characteristics should be built into the new item to bring about better consumer satisfaction.

▶ **Substantiating R&D efforts.** Lab products are given in-home checks with consumers at all stages of storage, preparation, and use. This indicates whether or not consumers recognize the elimination of the negative factor. If not, more R&D work is called for.

Spearheading this fact-digging is the president's revolving fund for All-Borden R&D. The fund supports special projects over and beyond each operating division's current research budget. When a division "borrows" from the fund, it "pays back" in regular installments so that allocations can be made to other worthwhile projects.

Though Borden today is a research-minded outfit, it didn't come by that role easily. As the American Institute of Management observed in a recent analysis of the company: "General management has been aware for several years that the company's position in its new, broadened markets must depend on the development of strong products. But it knew that other levels of management must achieve a more general acceptance of the need before it could put its conviction into practice."

Feeling was that in the milk and ice cream field, the maze of government regulations left little room for successful new-product ideas. And Borden Foods Co., at first, was preoccupied with digesting its reorganization.

Today, an enthusiasm for more research runs through all segments. Here's how the transition is described by AIM: "When the Institute first carried out its interviews, some executives underestimated the importance of research. Others seemed to look on it as merely a defensive measure. Before the end of the Institute's study, the same individuals were eagerly pressing ahead for more research."

Pres. Comfort sums up the transition with the observation that "all divisions reflect the conviction that the most promising avenue of growth stem from the laboratory and consumer and marketing research."

Certainly, last year's impressive flow of new items and packages reflected the company's fruitful R&D program. Among the firm's new contenders for shelf space were coffee ring, block-shaped cheddar cheese, cream cheese bars, onion-flavored dip and dressing with a half-and-half base, improved chocolate flavored mix, gourmet line of cheddars, ice cream flavors, plus redesigned packages.

Pinning the Future

Pulling all these separate elements together is a years-ahead planning program. Kahl's marketing department, for example, works with two written plans—a short-range 1-yr. estimate and a long-range 5-yr. projection.

The 5-yr. plans, worked up by the marketing managers and reviewed by Kahl, include such details as (1) evaluation of marketing position of each product line, (2) initial plans for improvement in long-term sales and profits, and (3) effect of forecasts on long-term sales, profits, and capital investments.

The last element is further evidence of the company's linking fiscal control with marketing strategy, since product planning must guide investment spending.

The shorter 1-yr. forecasts are a running check on how the long-range plans are working out, and indicate where revisions are needed.

Although the company's overhaul hasn't been completed yet, last year's profit improvement suggests that the company has taken a big step forward in the drive to become as prominent in convenience foods as the parent company is in the milk business. For, as AIM summed up its audit, "Borden is proceedng to a promising future on the solid foundation which its past performance has established." —*End*

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DATA turned up by national check of 4,661 supermarket customers provides marketers with . . .

Better Fix on Shopper Image

Latest consumer buying habits survey by Du Pont gives you up-dated insight on who your customer is

KNOWING WHO your target is sharply influences the success or failure of your merchandising strategy.

Some up-dated valuable aid that brings the consumer into better focus is provided in Du Pont's latest *Consumer Buying Habits Study*. Some of the more significant findings:

- **Impulse buying is still increasing.**
- **Shopping is becoming more of a family affair.**
- **One-stop shopping may not be as widespread as commonly believed.**

According to Du Pont, only three out of ten purchases are specifically planned by the housewife before she enters the supermarket. Of the remaining seven decisions made in the store, 73.3% are completely unplanned or made on impulse–as against 67.6% in the company's '54 survey and 57.6% in the '49 check.

Packagers and others argue that this high rate of impulse buying points to the importance of stand-out packaging that catches the shopper's eye and vote. However, some feel there's a second–more disturbing–side to the coin–namely, that the consistent rise in unplanned buying indicates a declining loyalty to specific brands. If the shopper enters the store with fewer planned purchases on her shopping list, she's more open to the inducement of lower-priced private labels–and the favored shelf position retailers give to house brands.

Re-Check on Advertising

Family shopping is on the rise, the survey reports. Two out of five shoppers are now accompanied by men or children, and only one-half of the purchasers are women alone.

Implication here, as Du Pont points out, is the need for more merchandising slanted to the whole family. This may not sit well with those magazines who tout the female of the species as the big decision-maker when it comes to food buying, but it will hasten the trend to aim advertising at specific markets.

Despite the greater number of products found in supermarkets, and the availability of parking lots, a great proportion of shoppers still find it necessary to go to the supermarket more than once a week. According to Du Pont, 26% of the shoppers make two trips a week, 24.2% three trips, and 13% four trips–as against 18.9% who make only one trip.

One interesting finding is that shoppers now spend 50% more time in the supermarket per trip, but buy only one additional item in all that time. Today's shopper spends an average 27 min. per supermarket trip (vs. 18 min. in '54) and walks out with an average 13.7 items (vs. 12.7 in '54).

While the greater in-store time gives marketers more opportunity for store-level merchandising, you get varying reasons as to what women do with that time. Retailers say that she's made the supermarket a center to socialize with friends. Sociologists argue that the dazzling array of modern packages puts her in a trance.

Another survey finding that highlights the importance of package appeal is the disclosure that 22.4% of the shoppers were employed. Thus "shopping-on-the-run" is a necessity with this group.—*FE Staff*

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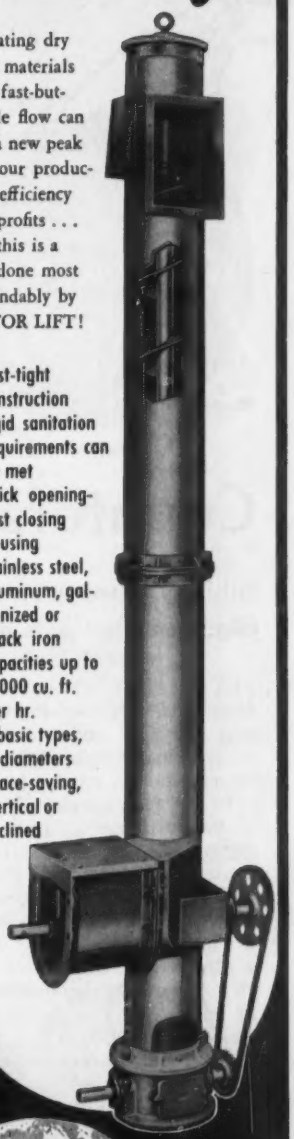

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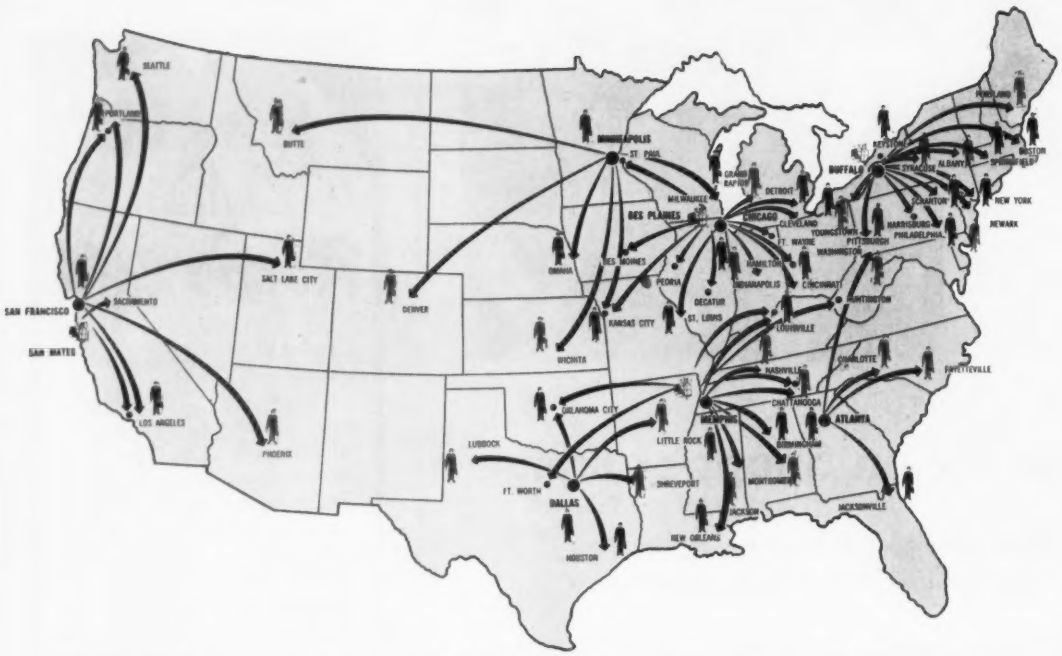

'OPERATION CONCENTRATION' adds 21 new Pillsbury branch sales offices (color figures) to previous 30 (black figures), coordinates grocery sales force with service center-warehouse distribution system. Revamp moves sales decision-makers closer to big-volume customers for tighter manufacturer-distributor relationship.

Counters Retail Power Play

Pillsbury's 'savvy' program offsets grocery consolidation with sharp sales realignment that puts decision-making where it counts, betters customer service

KEY MARKETING trend food firms must figure on in their planning is the stiffer competition brought about by concentration of business in the retail grocery trade.

In '58, for example, a mere 10% of the total number of retail food outlets were represented by supermarkets doing over $375,000 annual business. Yet they did a whopping 68% of total food store volume.

This consolidation has produced a parallel concentration of the grocery trade's decision-making people in certain key cities. It's also created local conditions that manufacturers must meet through creative local sales management.

With this trend toward more concentration of business in fewer centrally managed stores, each sale by manufacturer represents a sizable order. It's a situation that calls for salesmen qualified to meet local conditions.

This challenge has been met head on by Pillsbury's hard-hitting grocery products division sales team. The company's answer: Decentralized sales management, concentrated against key trade at major trade-control points.

Called *Operation Concentration*, the program focuses sales manpower where the business is.

New organization—not a management-reduction program—created 21 new sales branch offices and dissolved 3, for a net gain of 18. Now there's a total of 51 branches and 7 regions, where there were once 33 branches and 8 regions. Furthermore, 2 offices were relocated closer to the headquarters of major accounts.

Operations run silk-smooth, since the grocery sales force is coordinated with the service center and distribution warehouse system (FE Jan. '59, p. 52).

The setup, of course, has added new branch sales managers. In addition it's created three new groups of managers—account sales, area sales, and account—whose jobs are specially tailored to meet evolutionary changes in the grocery business.

Says Earl Clasen, division v.-p.: "Basic concept of our organization plan was developed out of a careful study of changes taking place within the grocery trade. The program, however, couldn't have been completed a year ago because of lack of trained management. Now our manpower development program is opening up its own opportunities."

Sales Manager Dean Thomas points out: "*Operation Concentration* considerably broadens sales management opportunities within the division. Whereas the old field sales manager had to administer many sales-supporting duties—ordering, accounting, furnishing office supplies, etc.—the new branch sales manager is first and last a professional salesman. He's primarily a manager and developer of sales manpower."

Reporting to the branch head are the three new managers. Area and account sales managers have similar responsibilities — training salesmen and servicing key district accounts. Only difference between them is a matter of geography and number of key accounts.

The area sales manager is primarily

accountable for working with salesmen (under him) who are generally deployed over a large geographic area. His chief job is to train and develop his men, with key accounts his secondary responsibility.

Main responsibility of an account sales manager, on the other hand, is to service a group of key accounts controlling the major tonnage. He also deploys and trains sales merchandisers in support of his programs with these key accounts.

Finally, there's the account manager who handles one or more key direct-buying accounts. He calls on accounts' headquarters and retail outlets, and he's personally responsible for Pillsbury business with his customers. To leave him free to devote his energies to building these big volume accounts, he's relieved of supervisory or training responsibilities.

Thomas puts great stress on the need for upgrading sales talents. In a recent memo to regional sales managers (who supervise branch sales managers) he emphasized: "If we're to catalog all our opportunities in our 'Reach for Greatness,' highest on the list would be our managers increasing their skills in the decentralized sense of 'local' management that's now company policy."

What Move Means

Pillsbury's decentralization program (adopted 2 yr. ago) pushes decision-making farther into the field —nearer to where the action takes place. It's the company's idea of breaking down business to get it closer to the markets.

This is getting decisions made at the right place where the most facts —from market place and local situation—are available. Of course, headquarter's experience and special knowledge will still be used by the managers.

The company strongly feels that decentralization and selling concentration, working hand-in-glove, will provide Pillsbury's 542 salesmen with a marketing edge in the competition for America's "stomach space." Grocery products account for the largest portion of the firm's $350 million sales.

What also makes the concentration-decentralization marriage so important is the size of the modern grocery business that's made a profession out of selling. When a single store may handle over 5,600 products, you need front-line men capable of making vital decisions on spot.

—FE Staff

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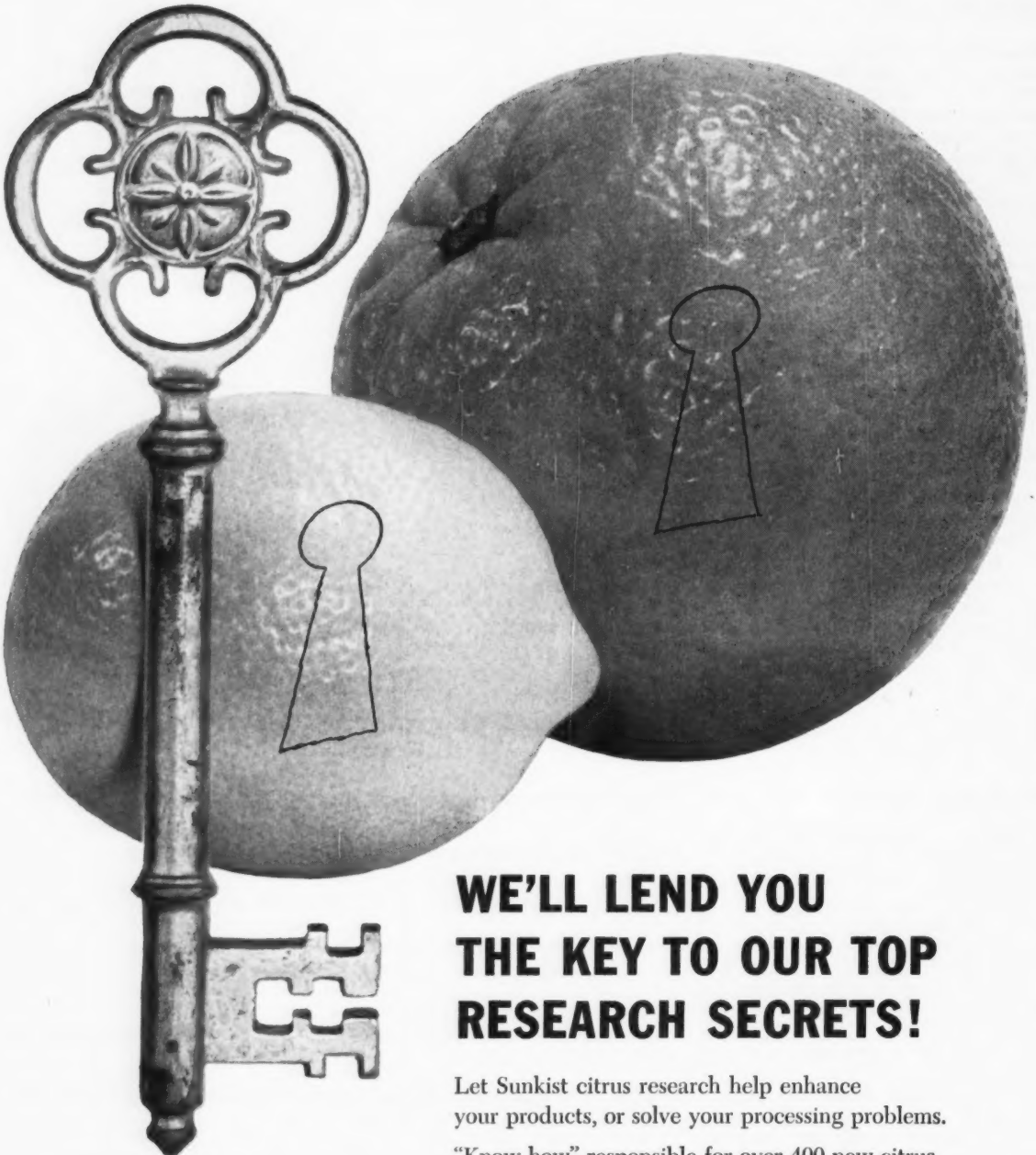

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Sunkist Growers

PRODUCTS SALES DEPARTMENT

CAN LEMON JUICE DO A JOB FOR YOU?

If you're a food processor... fresh, frozen or canned...fruits and vegetables...fish or fowl... lemon juice can do *at least* one thing for you:

- It can prevent or retard off-flavor tendencies...
- Maintain and even enhance natural food flavor—keep food fresh-tasting longer...
- Prevent oxidation, preserve color, texture and flavor during and after processing...
- Adjust acidity in low-acid foods–retard enzyme action...
- Replace salt in low-sodium diet foods...

And that's only a beginning. The list of jobs lemon juice can do is an extensive one.

If you're not using it...you may be letting the competition get a lead on you. Don't market a product that's merely "as good as" the rest. Exchange Brand Concentrated Lemon Juice—made by Sunkist—can often make it superior for only a penny or two—and add a selling ingredient of distinction to your label.

Why not let your Sunkist man talk it over with you?

The address: Sunkist Growers, Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

How to Lick Price Deals

*From files of National Consumer Panel of Market Research Corp. of America. Material is factually correct. Identities of products and companies have been masked to insure anonymity.—The Editor**

MARKETING CASE HISTORY OF MONTH

Management's problem

HEAVY PROMOTIONAL ACTIVITY by one of our competitors, with emphasis on frequent deal offers, seems to be affecting the position of our food specialty.

For years our brand has been the leader in its field. By advertising consistently, and without relying on price offers, we were able to attract substantial numbers of repeat customers as well as a steady stream of new users every year.

During the past year (since our competitor began dealing) we have continued our usual marketing activities. But our sales and share-of-market have gone down while those of the competitor have greatly increased. We know that a change in marketing policy is needed to meet this competition, but feel that a large-scale increase in advertising or recourse to heavy dealing will prove unprofitable.

We want to learn (1) in what specific ways our competitor is affecting our sales, and (2) what are the most profitable steps we can take to strengthen our brand's position?

WHAT WOULD YOU DO?

Management's decision

We ordered a study of the weekly purchase diaries of the families that make up the National Consumer Panel. By finding out *where* our competitor's customers were coming from and *when* they were obtained, we would be able to determine the extent to which users of our brand were being affected by the competitor's promotional activity.

We learned that our sales were being affected in this way—

1) Throughout the year, the competitor had attracted many more new users than previously, thereby reducing the number of potential new customers available to our brand. Hence, the number of new customers we attracted was less.

2) Most of the year, our users remained loyal to our brand. During certain periods of heavy competitor dealing, however, many of our customers, especially those who bought our product less frequently, were persuaded to switch brands.

Result of action

Acting on this information, we reshaped our marketing activities to do a better job of obtaining new customers and holding old ones.

We geared our advertising exclusively to attract new customers so that we could gain the maximum number of new users for each advertising dollar spent. When our competitor launched the kinds of deals that appealed to our repeat customers, we countered with deal offers of our own *designed to retain these purchasers*. Thus we reversed traditional marketing practices.

By using conventional promotional methods to increase our franchise and *selective* deal offers to defend it, we have been able to profitably maintain our brand's position in spite of a heavy dealing competitor.

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* For more information, write to Marketing Editor, FOOD ENGINEERING, 330 W. 42nd, New York City 36.

MARKETING SIGNALS

No 'Unfavorable Balance' in Food Trade

You hear a lot these days about the widening gap between American exports and imports. Such is not the case, however, with foodstuffs, according to figures FE secured from Office of Business Economics.

Between '53 and '59, U.S. exports of food products surged ahead 45%—from $1.7 billion to $2.5 billion. Over the same period, imports picked up a smaller 8%—from $3.3 billion to $3.5 billion. Also, the gap was narrowed from $1.6 billion to $1.0 billion (helped, of course, by Public Law 480).

Alas—FE's Cassandra on Beam

In FOOD ENGINEERING's "1959 Outlook" last year (FE Jan. '59, p. 41-45), we warned against expecting any real boost in food store sales because durable goods would soak up a lot more dollars than they did in recession-hit '58. Data just released by the Census Bureau tend to confirm this.

Although overall retail sales jumped a healthy 7.6% in '59—$215.6 billion vs. $200.3 billion in '58—food store volume trailed with a middling 2.9% gain—$51.7 billion vs. $50.2 billion. Looked at another way, food store share-of-total-sales dipped from 25% to 23.9% in the same interval.

The reason: Spanking 13% upsurge by durables.

There's one cheering note, though. Return of good times was celebrated by more dining out. Sales of eating and drinking places moved up 5.4% (from $14.8 billion to $15.6 billion).

Florida 'Togetherness' Pays——A Little

Eyebrows were raised last fall when Florida's concentrators, a scrappy breed, decided to join hands in an effort to move heavy inventories of frozen orange juice. But initial returns indicate that the joint $3.3 million ad campaign did help move a lot more juice.

According to Market Research Corp. of America, weekly purchases, compared to previous year, were up 29% in Sept., 22% in Oct., 27% in Nov., and a rollicking 57% in Dec. However, a good chunk of the increase was PL merchandise.

And stocks are still on the heavy side—19.5 million gal. on hand at the end of '59 vs. year-ago figure of 8.7 million gal. Estimates are that sales will have to be hiked around 15% this year.

Busch Foams Record Brew

First place in the beer sweepstakes last year went to Anheuser-Busch for the 3rd consecutive year, according to figures compiled by National Beer Wholesalers Assn. and *Brewing World*. The firm sold 8.0 million gal., about 15% more than in '58.

Schlitz, knocked from first place by Busch in '57, fell further behind as its '59 output dipped to 5,860,000 gal. (vs. 5,875,000 in '58). Only other shifts among the Big 10 saw Carling continue its meteoric rise, this time picking up two notches to move into 4th place, while Pabst ended up in 6th.

Meanwhile, the Justice Dept. scored an anti-trust victory when A-B agreed to sell a Florida brewery it had bought from American Brewing and to refrain from acquiring an interest in any domestic brewery during the next 5 yr. without first getting court approval. Elsewhere, the decline in regional breweries continued when Baltimore's Gunther Brewing was bought by Theo. Hamm Brewing as part of Midwest firm's first step to expand in the Eastern market.

Bumper Crop for Bumper Sales

Baby food sales will increase 80% to 278 million dozen cases by '70, predicts Sales V.-P. Stanley R. Pomfret of Beech-Nut. He estimates that average yearly increases will be 12.6 million dozen, based upon a 51% expansion in the annual birth rate from 4.3 million to 6.5 million during the present decade.

Beech-Nut, No. 2 in the field, figures sales of all baby foods will reach $270 million this year, and $400 million the next 10 yr.

New Dimension for Point-Of-Sale

Closed circuit TV, which has proved effective for certain in-plant operations, may provide marketers with one more in-store chance to wrap up the sale.

Results of a 3 months' test in Grand Union outlets show that sales of items plugged on the TV system were up 30% while total store volume increased only 10%, reports Store-Video Inc.

Other findings, according V.-P William Yoell: In-store TV ads work best with medium or fast movers; must be used for 2 weeks for shopper-penetration; should be designed with minimum copy for maximum impact during 7-sec. exposure.

BRIEFS

Trips to Hawaii, our newest state, are favorite contest prize among food firms. In upcoming promotions, Dole offers winner 2-weeks vacation there with $10,000 in cash, Seabrook Farms a "Second Honeymoon" in the Islands plus $250 in spending money.

Bigger need for canned foods in foreign markets is seen by Green Giant's newly-formed International Div. Sales and production outlets will be studied.

Long-range plans of Chun King call for doubling and redoubling sales: To $50 million by '63, $100 million by '68.

Nation-wide clearing house of marketing manpower available for new assignments has been started by Sales Executive Club of N. Y.

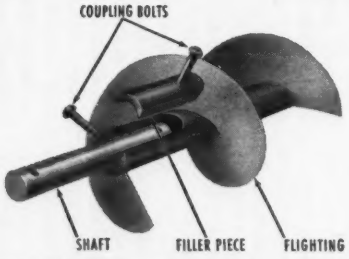
More non-food store outlets for food makers: United Whelan drug chain will include food supermarkets in planned network of one-stop shopping centers.

Armour's direct selling to big-volume accounts was up 25% last year, firm reports. Arrangement is confined to the East.

Effect of convenience items on consumer's food bill will be probed by two USDA studies this year.

How Quik-Link conveyor screws

KNOCK DOWN DOWNTIME



HOW IT WORKS — First, coupling bolts and filler pieces are removed from each end of screw section to be replaced. Then the hanger is unbolted, and entire section lifted from trough.

Only LINK-BELT Quik-Link lets you remove a single section without disturbing other components

Here's how you can side-step a serious production bottleneck. Quik-Link offers the fastest method yet of replacing a damaged screw and putting the conveyor back into service. Just a fraction of the normal time.

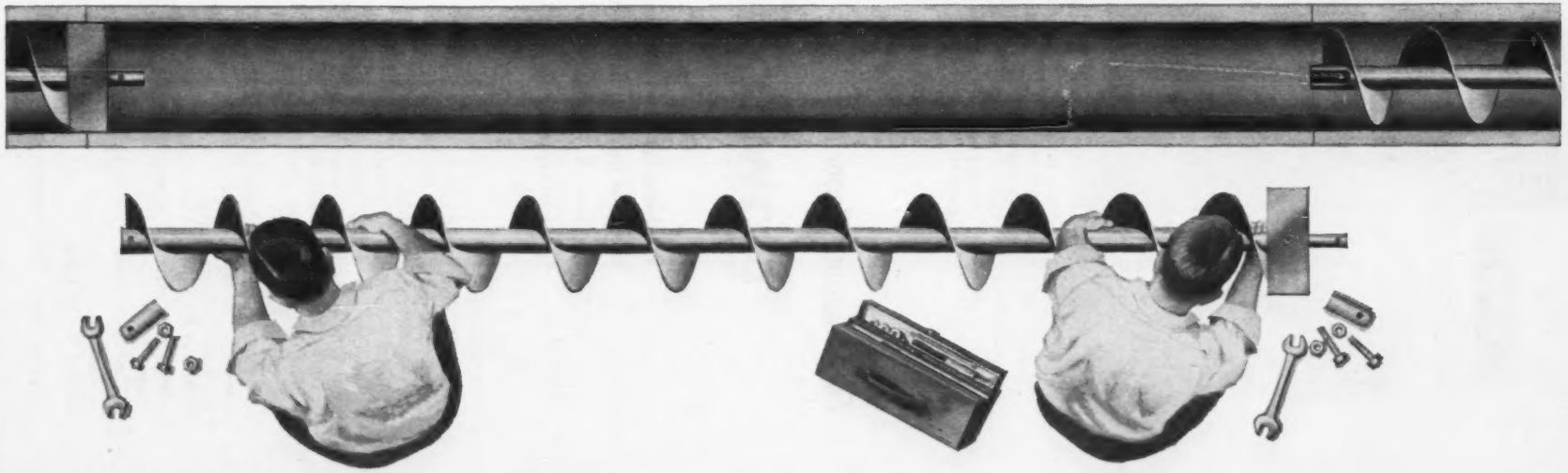
That's why it's time you investigated the "down-time insurance" built into every section of Link-Belt Quik-Link conveyor screws. Your maintenance men become quick-change artists in no time—a wrench and 30 minutes change the damaged screw section and put the conveyor back to work. What's more, there is no need to pull down the entire line . . . no need to disturb other conveyor components.

Quik-Link is just one of a whole group of Link-Belt screw conveyor components that are cutting maintenance and power requirements to the bone. For full facts call your nearest Link-Belt office or authorized stock-carrying distributor. Or write for Book 2989.

LINK-BELT

SCREW CONVEYORS 15,239

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.



INCREASING NUMBERS of food packagers now display products in sparkling transparent plastic containers. Fabricators are developing packages of many colors and of unique styling that move products faster. Non-toxic, odorless, and tasteless containers are waterproof, greaseproof, and resistant to high and low temperatures. They increase shelf-life for many food products.

FE Packaging Report:

How to Take Advantage of

Working facts on improved materials and forming methods that are now making these containers more effective aids to packaging success . . . Concise wrap-up of what you should know about thermoforms—their make-up, properties, and what's to come

SOONER than you think, the rigid plastic containers will be handling a much greater variety of food products than they do today. For their basic advantages are being sharply enhanced by bold advances in improved resins and fabrication methods.

The detailed picture given here will guide you.

As yet, there's no clear-cut volume figure on the use of thermoforms in the food industry—primarily because their development is comparatively new and has extended in many directions.

One large supplier guesstimates it may be around $60 million, or 1½% of the consumer packaging market (that includes paper, glass, foil, metal, and film). But one thing is certain: The figure is bound to grow as the suppliers set their sights on the big volume users.

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

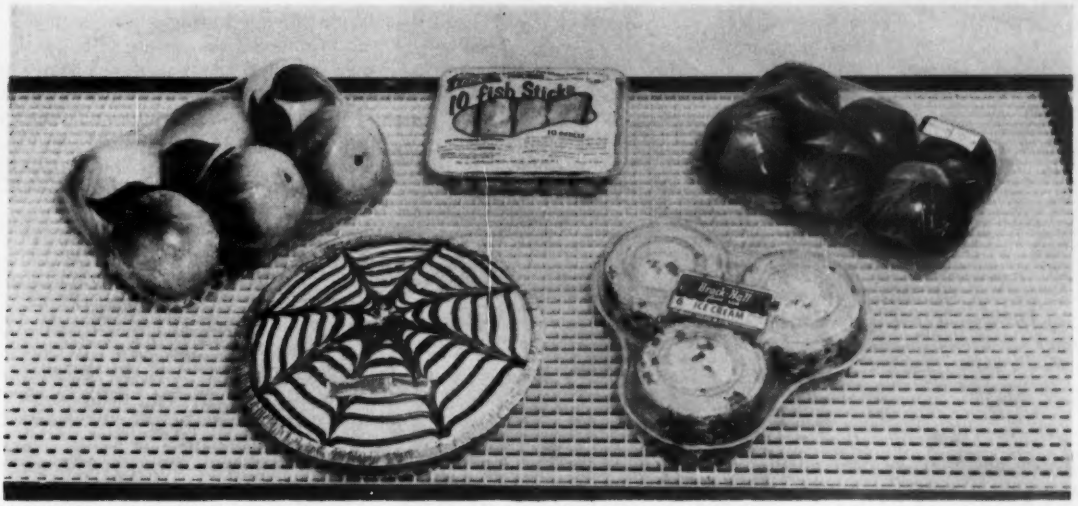
What's Taking Place

To button up trends that point to our industry's increasing use of rigid plastics, FOOD ENGINEERING surveyed manufacturers of resins and suppliers of finished containers. Here are the key findings:

1) Basic prices of raw plastic materials are **trending downward,** while those of metal, glass, and paper inch upward. Several plastic materials suppliers posted price cuts in '59.

2) New types of resins **widen the range of properties.** There is work with linear polyethylene, polyvinyl chloride, and polypropylene, along with tries at making still others feasible for food containers. Thermoformed linear poly, for example, looks like a good bet (cost-wise) for ice cream and cottage cheese.

3) New molding methods, plus new materials, permit forming—at lower cost—of **thinner wall-type containers.** Updated molding methods that overcome specific fabrication problems produce containers with more pleasing and functional shapes. Techniques in vacuum forming open new fields for such familiar plastics as cellulose acetate and cellulose ace-



COMBINATION POSSIBILITIES appear endless. Here are fruits packed in plastic trays and overwrapped and sealed with transparent film, . . . Fish sticks in plastic box with recessed lid, . . . Cakes in two-piece plastic packages, . . . And pie in foil tray with transparent, crimp-seal plastic cover.

Fast-Growing Rigid Plastics

tate-butyrate. Also programmed: **Vacforming of high-density polyethylene units** (as yet no commercial production).

4) Some believe captive **fabrication operations** (extruder to provide continuous operation of all plastic materials to fill-seal packages) will gain in the future, though on a moderate scale. Others look to more thermoform installations, especially the form-fill-seal machines.

5) Development of **lighter weight, non-breakable containers** are reducing damage as well as handling and shipping costs. There is also more activity in lightweight, single-service containers.

6) **New linings** formulated from polymeric materials, together with better ways of applying them to inner surfaces to overcome permeability problems (as with poly bottles), are finding increasing uses. But as yet such developments don't seem to be directed to a food-type "bottle-within-a-bottle."

More than likely, improvements in permeability lie in the development of linear resins. These will also increase container's stiffness and reduce costs through thinner wall sections.

7) More and more, plastic containers will be used in **conjunction with other materials** (metal, foil, and film) to get the fullest property advantages from both.

8) Plastic people even eye the possibility of using **exterior coatings** to improve container appearance and protection.

9) Experiments are underway in the use of plastics (nylon and poly) for **aerosol packaging.** Once technical difficulties are overcome, researchers say, the advantages of light weight combined with long-term possibilities of cost reduction may well result in a considerable demand for such containers.

10) Beginning to appear are **medium impact-type styrenes.** They're stronger than general-purpose styrenes, offer greater clarity than high-impact types.

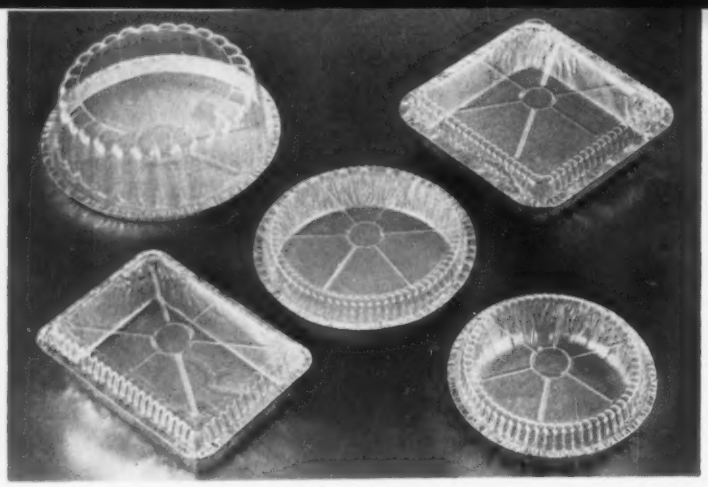
11) **Side-wall printing** of rigid plastics—something that many once said couldn't be done—is now a reality. But the big problem here is price.

12) One supplier envisions whole dinners being pre-cooked and packaged into **edible plastic polymeric containers.**

13) There's expanding use of the **show-off type** of injection-molded high-impact styrene units (with styrene or poly lids) to give ice cream packs added prestige. Over 40% of the country's ice cream producers are using these crystal-clear plastic throw-aways — some to distinguish their fancy quality product from standard grades put up in paperboard cartons.

These plastic packs are designed for consumer appeal with visibility to show colorful flavor ripples, color diversity, and product fill. They also answer retailer's merchandising needs for durability, display ease, and speedy self-selecting.

They've had a great impact on sales. One dairy reports a 50% increase since switching its ice cream into the plastic. Another jumped its sour cream sales 700% after adopt-



PLASTIC-FOIL DUOS are available in variety of eye-catching styles. Designed for baked goods, they comprise aluminum-foil bases and pressure-formed biaxially oriented styrene tops.

ing vari-color ½-pt. styrene containers.

14) Suppliers are emphasizing **expendable instead of re-use features.** It used to be that consumers bought these premium-priced containers with an eye on their re-use value. But then they piled up in households.

15) **Stronger and lower cost** plastic containers that take less resins in their thin-wall constructions assure housewife that she's no longer paying premium prices. Result is she's growing less hesitant in buying them.

16) It must be borne in mind that the new Food Additive Amendment is expected to put something of a damper on future progress in new plastic containers. Legal bans against any substance that may affect food involves plastic packages that contain food-migrating materials like toxic-suspect stabilizers and emulsifiers.

Variety of Plastics

Aside from polystyrene, other major thermoplastics going into food packaging are polyethylene (of varying degrees of rigidity) and cellulose acetate. As for others, here's a short rundown.

. . . New styrene acrylonitrile copolymer is being injection-molded. It's tough, has good transparency, is heat-resistant.

. . . Vacuum-formed cellulose acetate-butyrate containers are used, but to a very limited extent.

. . . Polyvinyl chloride has been thermoformed into inexpensive, upgraded trays, used for their decorative and functional properties in the packaging of produce and expensive confections. It's tough to formulate PVC resins so that they can be easily fabricated into rigid food containers. But, because of resin's low base price, fabricators are re-examining this plastic.

. . . Vinyls have been used for about 10 yr. in portion-servings of jams, jellies, mustard, table syrup, ketchup, etc. Throttling further extension of their use are problems involving incorporation of proper stabilizing systems. Presently, it's difficult to obtain FDA-approved formulations enabling easy fabrication of the materials into containers with desired physical properties.

. . . FDA clearance on certain types of nylon is expected in the near future. But resin's limitations are cost, opacity, high water-vapor permeability, and inability to be thermoformed. Blow-molded nylon bottles haven't, as yet, made inroads in the food industry.

. . . Ethyl cellulose's cost restricts its use in volume packaging.

. . . Polypropylene hasn't been FDA-cleared because of inadequate data from chemical extraction tests. This Italian-developed polymer is brittle at low temperatures, so there's little chance of its use for frozen foods. Its advantages: Density that's lower than low-density polyethylene, higher tensile strength and softening point (good for sterilizing cooked foods). What's more, it can be blow-molded into bottles and vac-formed into containers.

. . . The acrylics can't beat polystyrene in price and moldability (especially in thin-wall sections). However, containers of this material don't break as easily.

. . . Melamine's uses are limited because of opacity and lack of color possibilities. There's doubt of using it to attain economical wall thickness and subjecting it to molding cycles.

. . . Urea's restrictions are similar to melamine's.

. . . Phenolics are 'out' because of carbolic acid carry-over. Like melamine, they're opaque and difficult to mold.

How They're Competing

Where plastic containers have replaced conventional ones, they've done so at higher cost. To remain competitive, they've relied on increased sales appeal and, in a few cases, improved functional properties. Being lightweight—maybe one-fifth as much as comparable glass units—savings in freight rates help defray the extra costs.

There's even been progressive penetration into large-volume markets, where a premium-price package has little demand. This indicates favorable price trends and technical progress in making thermoplastics competitive with paperboard.

Beyond their rapid growth (especially for product uses other than foods), there's an increasingly favorable price trend for most thermoplastics. Aside from lower material prices (particularly polystyrene and polyethylene), there have been constant improvements in fabricating. This targets production of stronger, better designed and cheaper units.

For example, over 90% of the molded plastic containers are polystyrene, with growth attributed to resin developments. Its strength, low cost (through thin-wall molding), ease of fabrication (injection-molding) for high-speed production, and clarity makes it a good food container. One supplier's even claiming higher production rates from lower-cost polystyrene sheets enabling competition price-wise with paperboard containers.

Even its greatest drawback—low impact strength—has been overcome through development of various modified styrenes. Typical are the polymers of styrene derivatives (polymethylstyrene), copolymers like acrylonitrile, and physical mixtures such as small percentages of rubber to increase toughness.

Preliminary experiments at Illinois Institute of Technology point to a 25% increase in polystyrene's tensile strength by processing the plastic in an electrical field while subjecting it to external heating. This evidence has prompted researchers to

further explore improvements in material characteristics (elasticity and tear strength) of such other plastics as polyethylene and vinylidene chloride.

Containers are even fabricated from oriented polystyrene for dimensional stability. They are effectively heat-sealed with transparent film, for sparkling appeal in the packaging of produce and even seafoods.

Available are a choice of polystyrenes to suit the various requirements of different forming processes and equipment. Container fabricating details—pressure, temperature, gage, cycle-time, mold design, etc.—have been worked out.

Packages are readily printed, die-cut, creased, beaded, folded, embossed, laminated, metalized, and heat-sealed on conventional equipment. And containers indefinitely retain their shape and dimensions through a wide range of temperatures.

The stiffer high-density polyethylene has been molded into semi-rigid bottles (with or without linings) which, through their toughness, feather weight, heat resistance, and low cost, are beginning to compete with cans and glass bottles in non-food fields. Moreover, this high-density plastic is the first having marked crystallinity for use in high-strength, heat-resistant containers. These materials are also less permeable to gases and water vapor and more resistant to grease than the low-densities.

German high-density polyethylenes have sparked talk of their potential for bottles. C. H. Bukner, of England's Patra research staff, thinks they'll compete with glass with 5 yr. and obsolete milk deliveries in glass bottles. As for beer and carbonated beverages, G. S. Babcock, of Owens-Illinois, indicates that tests point to raw-material problems (which suppliers are now checking).

Use of polyethylene bottles has been shunted from many markets due, primarily, to their permeability (causing excessive loss in product weight and changes in color or flavor), their "greasiness," and their distortion.

Fluorination of the poly to reduce permeability is a new development. However, further research is necessary here.

Plastic engineers are overcoming various fabrication problems with improved grades and combinations of plastic sheets. Challenging development in the polyethylene squeeze bottle (that's made a showing in some industries) is application of coatings and interior linings.

Some suppliers report progress in modifying polystyrenes through use of coatings. While linings may improve the functional properties (especially gas permeability, chemical resistance, and moisture-vapor transmission) costs appear prohibitive. Other properties normally associated with a coating or lamination of thermoplastic (color, strength, toughness, grease resistance, etc.) are not severe problems here.

Most common route to improvement lies in development of linear resins. These offer means of increasing stiffeners, improving permeability, and reducing costs (thinner walls).

Pinpointing the Problems

True, plastic containers can't, as a general rule, compete with metal, glass, and paperboard. This is because cans and bottles supply hermetic seals at low cost. Even the best plastics transmit some gas and water vapor.

To get better impermeability (and greater rigidity), wall thickness must generally be increased beyond the point of good economy. Same thing's true with paperboard where plastics are combined (for impermeability, as in milk containers and frozen food cartons).

Feeling among some food processors is that the novelty of these plastic containers is not a merchandising advantage (except, perhaps, for initial sales) unless customer receives positive functional benefits. Aside from being more costly than glass or metal containers, they're reportedly inadequate for products requiring the exclusion of air and water-vapor or needing heat processing.

When lab-tested for certain products, these plastics didn't fare well. Ketchup, when bottled in gas-and water vapor-permeable polystyrene, darkened and hardened along body walls of container, and developed adverse flavor changes. Maple syrup's aroma permeated through body walls. Instant coffee picked up moisture and changed in flavor. Dressings turned rancid and bitter because of the effect of oxygen permeability on oils and spices.

Low-temperature (0F.), handling of case-packed styrene containers in ice cream plants is a problem. Workers must be taught not to toss them down ramps or chutes.

BLISTER PACKS are making headway for fruits and vegetables. Transparent, compartmentized thermoforms promote product protection, spur impulse sales.

Printing also poses difficulties—such as softening action by plasticizers that transfers inks to adjacent surfaces. Certain printing pigments make high-density poly bottles brittle, and there's a possibility that they might migrate into foods. Suppliers, however, expect to lick this problem with epoxies and other stable resins.

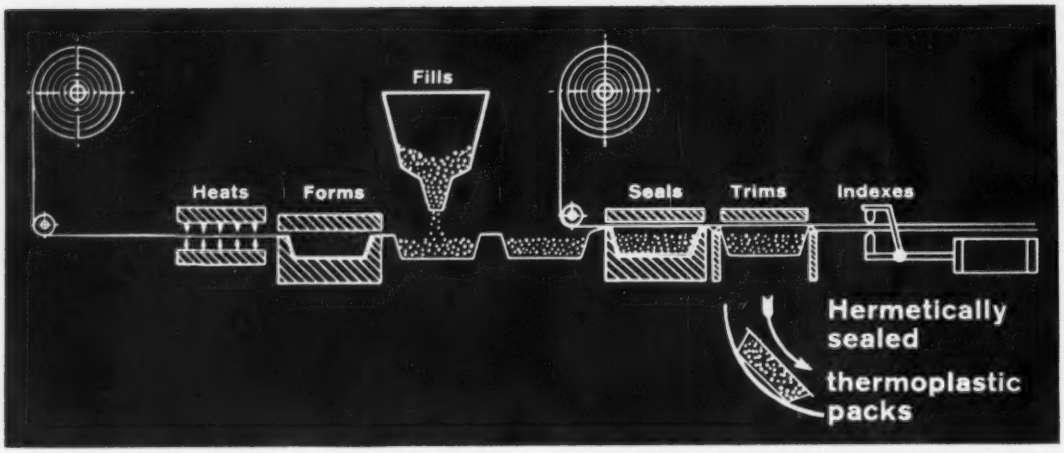
Lightweight plastic containers are tricky to handle on conventional packaging lines, especially in the area of automatic capping. Some capping equipment has been developed for molded and thermoformed lids used in combination with plastic or paper cups. Unfortunately, there's none for square containers—a factor that limited their use.

Of special promise are (1) special feeders that release containers one at a time from fillers and upright them on take-off convevors, as well as (2) cappers that unscramble and press-apply polyethylene lids to containers at 60/min. speeds. Progress is even being made to adopt conventional paper-labeling machines to plastic containers.

Infinite Varieties

Today, there are hundreds of plastic containers in a variety of sizes, shapes, and gages that can be closed (even heat-sealed) with a wide choice of insert or snap-on covers. They're of straight-walled, fluted, swirled, compartmented, or "serv-a-tray" design. And they're round, square, oblong, and rectangular.

Recently, seamless polystyrene sheets have been further strengthened by fluting—a new technique that employs controlled corrugation of sheet's sides. Aside from increased



STRAIGHT THROUGH METHOD forms variety of plastic sheets into low-cost containers that are then filled and sealed. Roll-fed sheet is drawn through infra-red pre-softeners to vacuum or plunger-assist molds. Heat-formed packages are filled and covered with film or heat-sealable plastic-coated board by high-frequency or thermal sealers. Trimmed units are then chuted from machine.

rigidity, fluted walls add distinction to the container.

To facilitate in-store stacking, containers have a fluted bottom and a center stacking ring on snap-type polyethylene lid. They're made from clear or high-impact polystyrene that's plain or colored.

A stackable combination foil-body container with clear acetate or polystyrene cover, recently fabricated for baked goods and pre-cooked frozen foods, is sealed by crimping foil over edges of protective display cover. Product can be oven-heated in foil case after removal of cover.

And the parade of plastic containers continues:

▶ Flexible polyethylene "squeeze can" for syrups. Lightweight, unbreakable, it has a poly body with metal ends and a red poly snap-cap for convenient opening and closing. The polyethylene is extrusion blow-molded in molds similar to glass. It's reported that these containers are competing with lined cartons.

▶ Coming along are high-density polyethylene formulations for rigid, non-squeeze containers to compete with metal and glass.

▶ High-impact polystyrene tray, rib-serrated along vertical portion and containing polyethylene lid.

▶ Low-cost, open latticework baskets (even trays as for tomatoes) molded from high-impact, sturdy polystyrene, and available in a variety of colors and sizes for fresh fruits and vegetables, berries, bakery products, frozen fish and seafoods, cookies, confections, meats, poultry, and frozen foods. In above cases they're replacing paper trays and making inroads into wood-type baskets.

▶ "Piggy-back" type of package for two products—one in a can, the other in vac-formed plastic bubble (0.015-in. acetate) snapped onto rim of metal container.

▶ Biaxially oriented polystyrene tray (10-mil) for popcorn or 7.5-mil styrene lid with multi-colored label. Tray is sealed semiautomatically by mechanical locking, and heat-sealed serrated lid gives maximum moisture-protection. Machine seals up to 40 trays/min.

▶ Disposable cellulose acetate pepper cellar (3¼-oz.) that's shaken or finger-pressure dispensed. Body's formed from pre-printed 5-mil acetate roll. And 8-mil acetate cap (with recessed base and indentations for perforation by housewife) is side-seam and acetone-applied after filling. Semi-automatic speed: 60 containers/min.

▶ Compartmentized cellulose acetate (0.01-in.) trays made with four or six cavities to hold two or three onions, or apples, or other fruits. New York State packer claims 50% increase in sales, 90% less handling damage. Produce packed in these cleaner, neater display containers brings premium prices, despite fact that trays cost almost three times as much as polyethylene bags.

▶ Stylized polystyrene tray (5-oz.) with snap-on polyethylene lid for cream cheese. When empty, oblong container serves as re-use refrigeration dish.

▶ Lightweight polystyrene or styrene-polymer foam trays (insulated-type) for fresh meats and poultry. Trays are either overwrapped with heat-sealable transparent film or sealed in see-through bags.

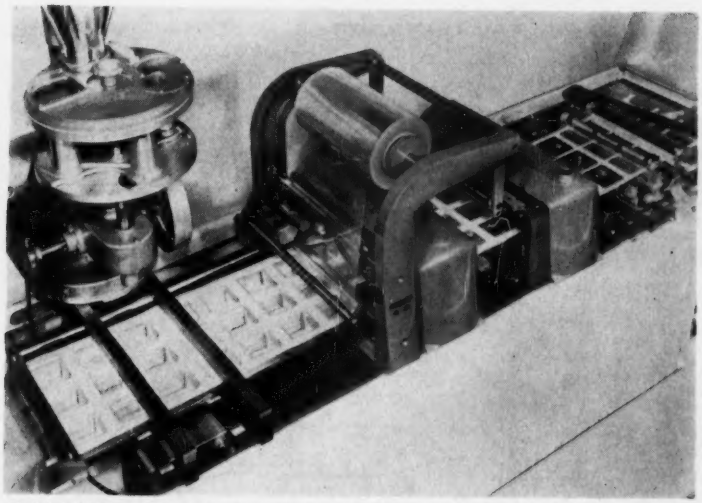
▶ Non-toxic, refrigerator-type vinyl containers recently introduced into West Germany for packaging herring, margarine, etc. To minimize transportation costs and storage space, containers are machine-fabricated in user's plant from roll of unplasticized polyvinyl chloride sheet (8-mil). Container is sealed with vac-formed vinyl cover and metal clamp-on ring.

▶ Introduction of a 1-gal. rigid polyethylene bottle handling a wide variety of liquids and designed to reduce transportation and warehouse costs. Blow-molded, square-shaped container is 2½ lb. lighter than glass jug of similar volume, takes up to 37% less space.

Walls are thinner than low-density polyethylene bottles. Rugged container is shatterproof and resistant to corrosion and permeation by most chemicals. It can be frozen or sterilized and easily disposed by burning. Unbreakable and lighter, it permits further reduction in packing costs, since thinner corrugated shipping cases (with less tare weight) are used.

▶ Expandable polystyrene candy tray that snug-fits into box.

▶ High-density polyethylene tray with new non-toxic oriented polystyrene film (1-mil) that "breathes" yet limits passage of moisture to and from products. It also prevents unsightly fogging, permits oxygen to



CLOSE-UP shows action of filling, closing, and trimming stations. Volumetric filler handles powdered free-flowing, uniform cut, or granular products that are filled into rectangular containers. Packages are formed six at a time in an opaque web, then closed with roll-fed transparent film by high-frequency sealer. Hermetically sealed containers are mechanically punched from web.

enter and CO_2 to escape (thus enhancing ripening of produce without perforations).

▶ Just out is a line of impact polystyrene containers for cottage cheese and other dairy products. Weighing only 14g. (16-oz. size), these units offer material savings that make them competitive in price with paperboards.

▶ Squeeze-type, polyethylene container molded into shape of a lemon. It has strong sales appeal and can be jumble-displayed in stores.

▶ Blow-molded polyvinyl chloride bottle for sauce. To be cited here, too, is increasing European uses of PVC resins for semi-rigid food containers.

Major Fabricating Methods

As for forming plastic containers, there are these basic methods and their developments:

Injection molding. Recent advances in precompression—valved and segmental impact molding techniques—help improve production quality and quantity. Method offers excellent surface finish and design flexibility.

Limiting factor is inability to mold thin-walled sections with low internal stresses. Trend is toward faster injection-molding equipment and better control of plastic flow to conserve material while permitting fabrication of stronger, thinner-walled sections. Look for wider use of these machines.

Blow molding (bottle blowing). Method is just beginning to take hold in this country. Until recently, only three firms were involved in blow-molding. Now, with development of several new machines increased activity is seen.

Recent development is use of polypropylene, linear (instead of low-density) polyethylene, and styrene in fabrication of more rigid, thinner-wall bottles.

Sheet forming. This extrusion-thermoforming technique perhaps holds the greatest potential. Fabricators are heating sheets and pressure-forming them against molds—even making deep-drawn containers.

More new machines are forming, filling, and sealing thermoformed cups or trays from roll-fed vinyl, cellulose acetate, and high-density polyethylene. Final sealing is with supported or unsupported transparent film—also supplied from roll stock.

This technique has also branched into the forming of skin, blister, or contour packages, wherein the formed-filled plastic sheet is anchored to paperboard backing. Advantages: Economy and adaptability.

Expected soon are high-speed lines turning out 300 packages/min., thus dropping package costs to a few cents. Higher-cost plastics will compete with other container materials when used for premium products. And equipment is adaptable to handling a variety of plastics with built-in protective properties.

One plastic supplier believes that thermoformed polyethylene eventually will expand through adoption of form, fill, and seal machines yet to be developed.

Another thing: Updated forming equipment and techniques using new plastic materials are appearing at an accelerating pace. Sequential impact molding is a radical improvement over conventional impact-molding. Method yields up to 50% more pounds of finished material.

Unlike impact molding (where melt is pre-compressed and then exploded into all mold cavities at one time), sequential method fills cavities in carefully timed sequences. This is achieved by timed opening and closing of valves in multi-nozzle manifold so that each cavity receives full pressure of injection setup.

Recently out is a non-stop printer and die-cutter for forming, filling, and sealing blister packs. Unit forms bubbles in butyrate acetate and vinyl plastic from roll stock. Then radio-frequency heating (di-electric) assures rapid, positive seal without overheating of product.

Using compressed air, a British-developed machine is printing four colors—in one operation—on plastic containers. This automatic multi-printer runs up to 40 containers/min.

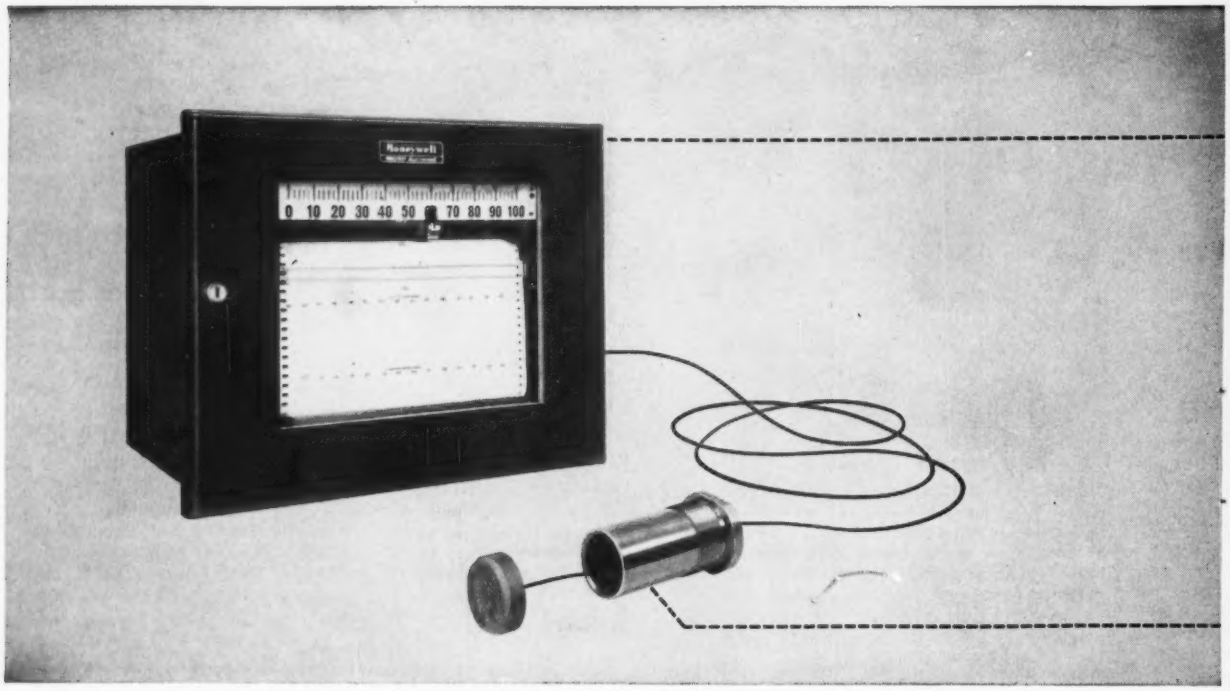
A German machine, the Allpac, is forming bottles from different roll-fed plastics. Unit, which can be adapted to fill and seal, eliminates pre-processing of plastic pellets. It requires only 3 min. initial warm-up time—compared to blow-molding machines that take 45 min. or longer.

New French machine forms a variety of plastic sheets (from roll stock) into many shapes and sizes of low-cost containers at up to 16,000/hr. Cost is reported to be half that of paperboard packages in France.

Machine heat-softens sheet, pressure- and vac-forms it into one to several side-by-side containers into which dry or liquid foods are filled. Then another plastic strip from a second roll is sealed onto top of packages. In final trimming operation, individual containers are cut free and gravity-chuted from unit.

—*End*

Acknowledgment: The author expresses appreciation to the following for their assistance in preparation of this Special Report: J. L. McKenna, Celluplastic Corp., Newark, N. J.; J. H. Beckman, Conapac Corp., N.Y.C.; R. J. Lee, Dow Chemical Co., Midland, Mich.; C. S. Booz, Jr., E. I. du Pont de Nemours & Co., Wilmington, Del.; F. A. Connell, Leedpak, Inc., N.Y.C.; John Kent, Monsanto Chemical Co., Springfield, Mass.; R. V. Jones, Phillips Chemical Co., Bartlesville, Okla.; Oke R. Henstrand, Plax Corp., Hartford, Conn.; and P. V. Spinner, Premium Plastics, Inc., Chicago.

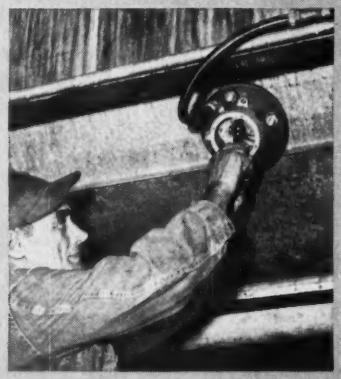


End-point control

Install the AMIF end-point control system in one day

After holes are cut in renderer walls, sleeve is welded into place . . .

the sensing element is then screwed into the threaded sleeve, and . . .



leads from the sensing element are connected to the *ElectroniK* recorder.

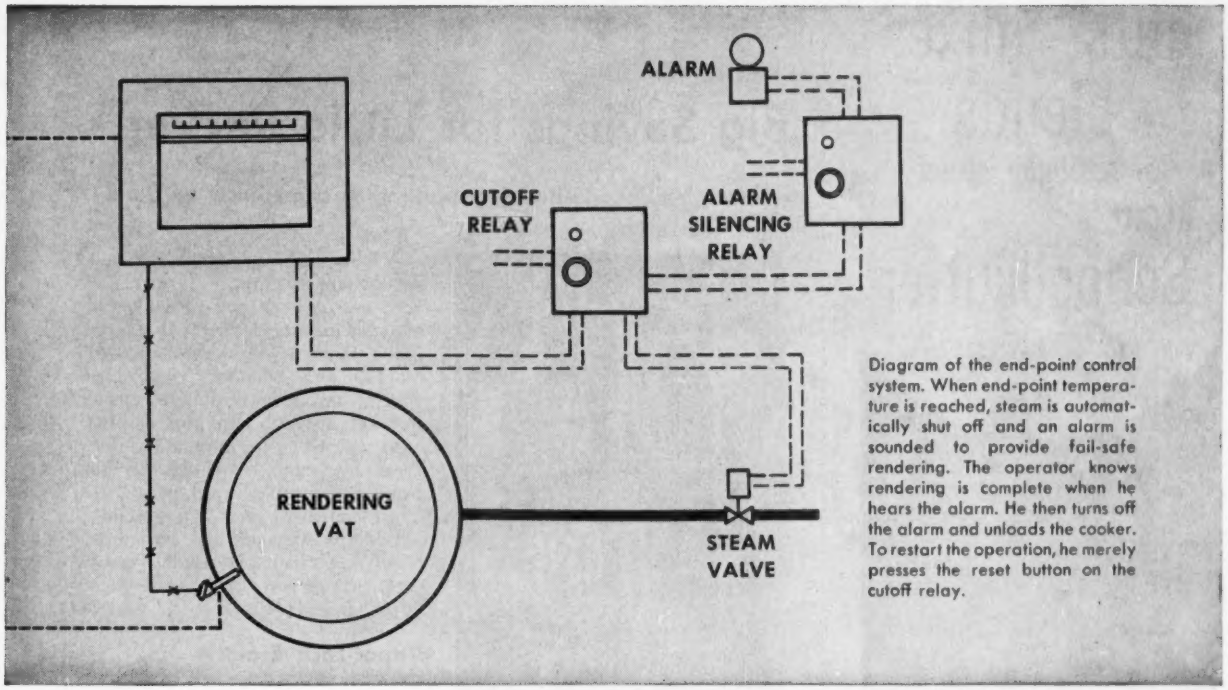


Diagram of the end-point control system. When end-point temperature is reached, steam is automatically shut off and an alarm is sounded to provide fail-safe rendering. The operator knows rendering is complete when he hears the alarm. He then turns off the alarm and unloads the cooker. To restart the operation, he merely presses the reset button on the cutoff relay.

improves dry rendering

AMIF *system prevents under- or over-cooking*

Maximum production of edible and inedible fats and high-grade cracklings comes only with close control of end-point temperature. Control of this variable is extremely critical, because temperature increases very rapidly at the point in the cook when moisture is at a minimum. AMIF system provides the sensitive, accurate control you need. It can bring you consistently higher yield and better color and keeping qualities, plus savings in heating costs . . . and can be used in both vacuum and pressure rendering.

The system *directly* measures liquid fat temperature. It consists of an *ElectroniK* strip chart recorder connected to a special thermocouple installed in the jacket of the rendering vat. This rugged thermocouple is made of specially tempered metal to resist shock and abrasion, and is flush mounted for freedom from obstruction. Its proximity to the charge makes it extremely sensitive to product temperature change. This thermocouple flashes the complete rendering story to the recorder, which keeps a continuous record of what goes on in the vat . . . shows at a glance when end-point is near or has been reached. It even reveals temporary stops of melter paddles.

The system can be equipped with automatic control to shut off steam and sound an alarm, enabling the operator to dump the cooker load at the critical end-point.

This basic temperature measurement method was pioneered by the AMIF on edible fats and oils. Subsequent work by Honeywell engineers with leaders in inedible rendering has further proved the distinct advantages of the system.

Your nearby Honeywell field engineer can give you complete details on this control system. Call him today . . . he's as near as your phone.

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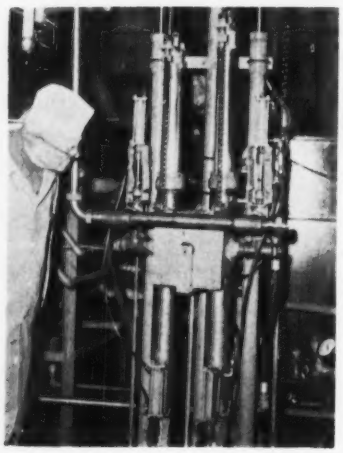
Big Savings for Little Packer

—through package-line ingenuity that trims costs to bone



HYDRAULIC PUMP transfers gravy from cook kettles to 10-pocket filler, eliminates air lock.

NO ROOM today for the small guy? There is, if you keep a sharp eye for ways to eliminate extra packaging-line costs.

Profit margin on our home-style mushroom gravies runs only a fraction of a cent a can. So we must "go modern" for the best payoff.

To cut costs, we concentrate on the most expensive operating items. For example, we got handsome returns from an inexpensive filling-line modification, slashing hand-packing personnel from 18 to 3 and more than doubling daily output (40,000 to 105,600 cans).

New company-devised unit comprises a 30-lb.-capacity hopper with a cam-operated vertical tamper feeding blanched chopped or sliced mushrooms to an auger (4x12 in.) directly over a rotary 26-pocket, handpack filler (FMC). Filled with 1¼ oz. of product, cans then proceed to 10-pocket gravy filler (FMC).

Now ready for installation are 40-pocket mushroom and 16-pocket gravy fillers—aiming to step up output—with the same three girls—from 220 to 260 cans (6 oz.).

Two other simple canning-line changes have netted savings:

A home-made can unloader places paper-wrapped empties (5 layers of 575) onto a U-shaped carrier ahead of an 18-in.-wide conveyor that feeds filling machines. With paper removed, girl operates hand-wheel which, through a double chain-sprocket assembly, elevates empties onto conveyor one layer at a time.

Second, cans from closing machine are tumbled into perforated retort crates set within a portable, water-filled metal tub. This way, cans are cleaned of overflow gravy before crates are electric hoist-transferred into retorts.

Vapor-Lock Trouble

Problem was alternate pumping of 275-gal. batches of extremely hot gravies from two cook kettles to filler. Since pump's packing and casting didn't expand and contract uniformly, the unit wasn't air tight, so it vapor-locked along the 30-ft. horizontal and 10-ft. vertical pipeline.

Solution was installation of an hydraulic pump (Safeway Engineering) like the kind used in oil fields. Stainless steel unit (50-gpm. capacity) consists of alternately driven stainless steel cylinders (3x36-in.), each holding ¾-gal. of gravy that is fed through hydraulic valve. Cylinders are hydraulically elevated 18 in., with remaining 18 in. achieved through electric-drive chain-sprocket assembly.

This slow-motion pump doesn't wear, requires little upkeep. Capacities can be easily altered from 2 to 50 gpm. by changing pulleys on 1-hp. motor. —*End*

STANLEY MAGIERA
President, North American Mushroom Co., Tinley Park, Ill.

Product Ingenuity, Too

Fast-climb of North American Mushroom Co. (its sales hit 10 million cans last year, up 2 million from '58) demonstrates how shaping product to kitchen convenience pays dividends.

When fresh-market glut dampened sales, firm developed canned mushroom gravies that not only save housewife preparation time but also end her dependence on beef drippings.

THE QWIP THAT TOPPED THEM ALL!

CONGRATULATIONS TO QWIP! In the 1959 Aerosol Packaging Awards Competition—Sponsored by the Chemical Specialties Manufacturers Association—this container for Qwip Dessert Topping won the Grand Award and top honors in the food products division. The Qwip container was manufactured by Canco for the Avoset Co.

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The prize-winning Qwip container is one more example of the way Canco cans and Canco creative lithography combine to produce packages with exceptional eye and sales appeal.

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Canco containers make good products sell better!

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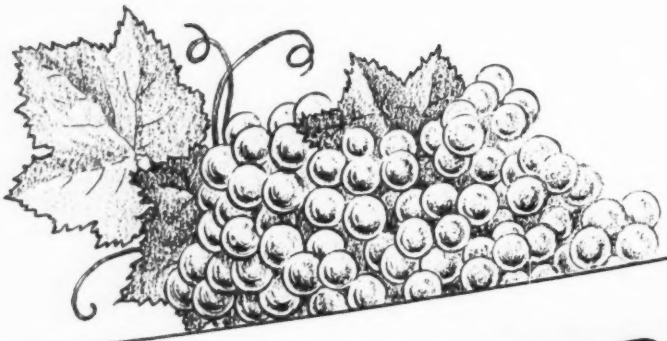

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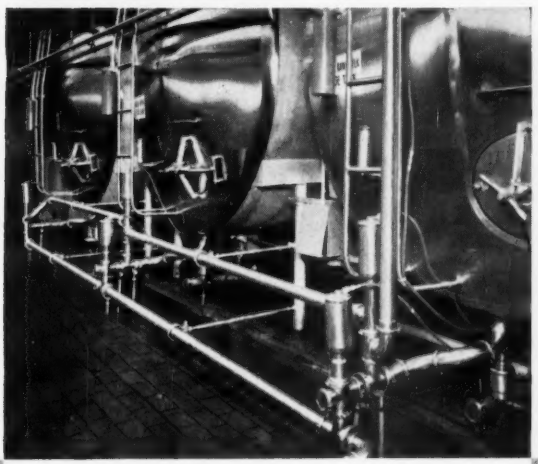
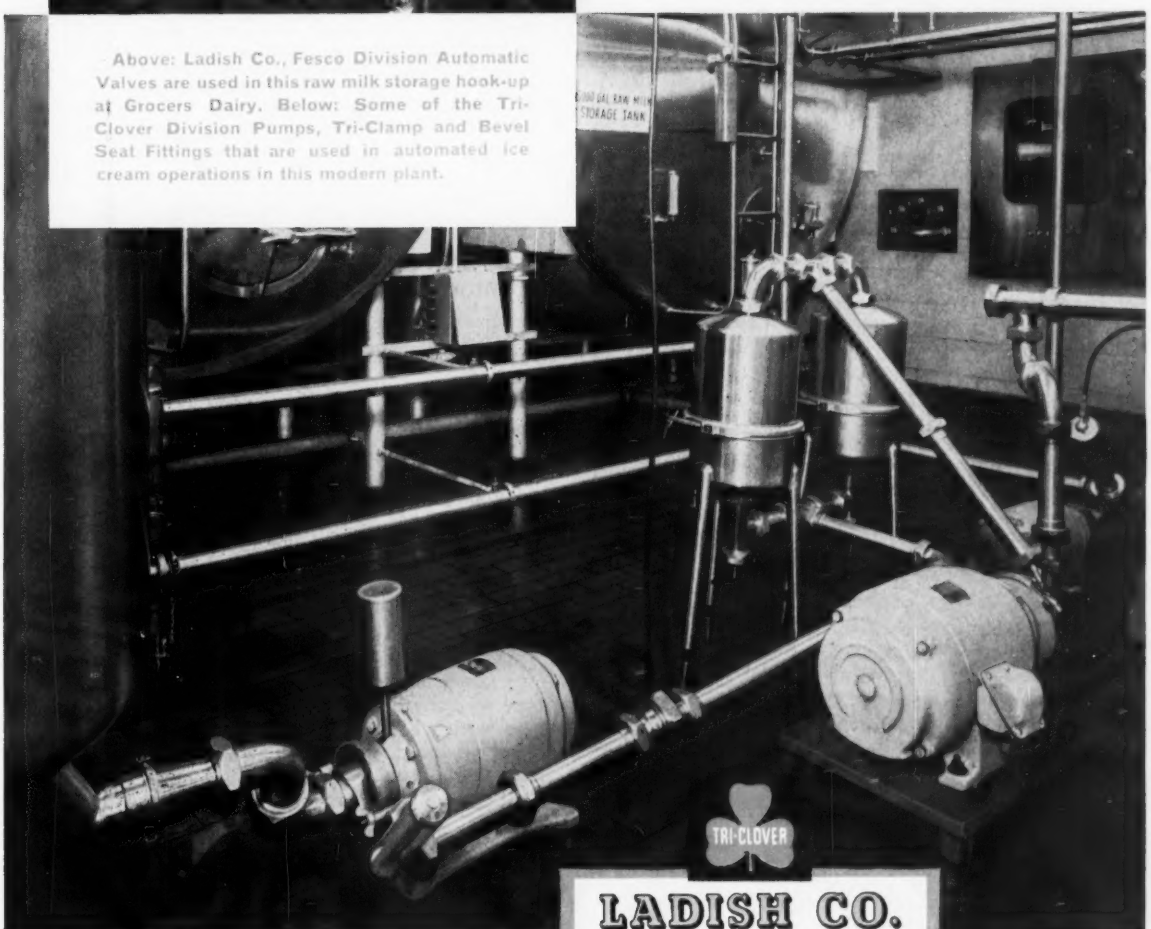
Automated installation at GROCERS DAIRY makes good use of TRI-CLOVER Sanitary Fittings, Valves and Pumps



Guarding against contamination, protecting product quality, and assuring an uninterrupted flow of materials in this modern, automated Grocers Dairy plant in Grand Rapids, Michigan, are numerous Tri-Clover quality stainless steel fittings, valves and centrifugal pumps.

Tri-Clover Division products are selected for jobs like this because of their reputation for highest quality materials and workmanship . . . and for the fact that they meet the strictest sanitary requirements throughout the dairy, food and beverage industries.

Above: Ladish Co., Fesco Division Automatic Valves are used in this raw milk storage hook-up at Grocers Dairy. Below: Some of the Tri-Clover Division Pumps, Tri-Clamp and Bevel Seat Fittings that are used in automated ice cream operations in this modern plant.



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MANUFACTURING

All-in-One Plant Sets '60 Pace

Now teamed under single roof, Heinz' multiple pickle and vinegar lines at Holland, Mich., click with new efficiency . . . Flexible equipment processes scores of different items . . . Electronics speed case movements

STREAMLINED into this modernized plant are seven formerly-scattered filling and case-packing operations. And efficient down-flow is feature of new routine. Initially processed on 3rd floor, pickles, relishes, and vinegars feed to high-speed bottling and jar-packing on 2nd floor, from where finished goods are whisked to ground-floor for trailer-and-RR shipping.

KEENLY PLANNED modernizing can do wonders in re-girding yesterday's operations to handle today's stepped-up demands.

And here, big performance dividends can be reaped through astute integrating of routines.

H. J. Heinz Co.'s re-structuring of its major Holland, Mich., pickle and vinegar facilities—producing 64 different packaged items and called the world's largest—strikingly illustrates such top-target revamping.

Management turned the job over to the engineering department, instructing it to consider every factor—from new equipment and plant layout through services and safety. All departments were then to be integrated in a final layout for best overall operation.

Result is a modern, clean, efficient new plant that's brim-full of ideas for every plant operating man.

For example, consider how Heinz brought Holland's formerly widely strewn production facilities under one roof:

In the old setup, seven filling and case-packing lines were scattered among five separate buildings, each with its own receiving and shipping facilities. Now, these lines—two for vinegar bottling, the remaining five for pickle and relish packing—are centralized on the new building's 2nd floor. Feed of processed goods is from the 3rd floor. And receiving and shipping are concentrated on the ground floor.

Spotlight on 6 Advances

Here are half a dozen major Holland-plant strides:

. . . **"Dairy-like" sanitary features** stressing stainless steel equipment, ceramic tile walls, acid-proof drained floors, and plenty of room for employees and facilities.

. . . **In-plant chlorination system** for sanitizing equipment and process areas.

. . . **Greater flexibility in mechanized processing** of products. For example, the vinegar-preparation setup has been designed both for conventional bottling and for spicing and sugaring of vinegars going into pickle and relish packs. And filling lines are adaptable for packing a variety of items.

. . . **New efficiency packing department** (2nd floor) laid out for advanced handling of cases, with unitized loads of empties transferred by clamp-type lift trucks to filling lines at both sides of the floor, and with loads of filled cases similarly picked up from central case-packing.

. . . **Electronically-operated conveyor-and-elevator system** for moving unitized case loads from receiving to filling lines and from case-packing lines to warehousing.

. . . **Centrally located electrical control centers** (2nd and 3rd floors) coordinating process equipment hookups.

Topnotch Working Conditions

Because of excessive process heat, standard air-conditioning isn't feasible. But air-replacement makes the plant cooler than most—a major forced air system (both production floors) supplying 28,000 cfm. of fresh filtered air, which is changed about nine times each hour. Hot, stale air is ejected from production areas via electrically driven motor vents.

There is glass bricking in a special "vision strip" along the production area's east and west walls. And fluorescent lamps keep lighting above the 35 foot-candles level.

A complete medical center is set up on the 2nd floor of an adjoining two-story employee-service building, with a nurse on duty at all times. Also housed on this floor are employee lunch rooms, as well as spacious lounge and locker rooms (with

stall showers and toilets). Supervisors (foremen and foreladies) have separate facilities. Receiving and shipping facilities are on the 1st floor.

Production Upstairs

To separate wet working areas, Heinz designers came up with a building that isolates processing equipment on the top floor. Turned out here are the varieties of pickles and relish as well as vinegar. Finished products are gravity-fed to the 2nd floor for jar-filling, canning, bottling, case-packing and sealing.

Warehousing is carried out on the ground floor, where two RR spurs permit indoor loading and unloading of cars. There are also two loading docks—one for incoming trucks and one for outbounds.

Making Vinegar

Preparation of vinegar for bottling and for pickle and relish packing is centered on the 3rd floor. It's pumped from the adjacent manufacturing building into agitator-equipped wooden blending vats. From several batteries of vats, each connected through stainless steel piping and valves to stationary centrifugal pumps, blended vinegars flow through plate-and-frame filter and plate-type heat-exchanger before going to bottling.

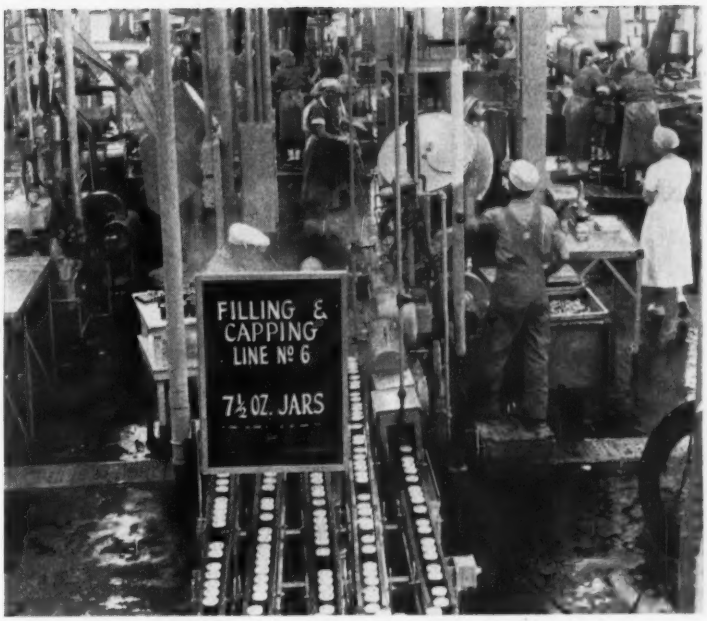
From other batteries of vats, blended vinegar is pumped to two preparation areas. One consists of a battery of stainless steel kettles for blending spices and herbs with the vinegar. Blended vinegars are pushbutton-discharged to 2nd-floor filling lines handling sour pickle varieties.

In the second area, sweet pickle vinegars are blended for still other pickle varieties. Palletized bagged sugar is loaded by fork-lift trucks onto a dumping mezzanine. Sugar is then charged into a battery of glass-lined, steam-jacketed tanks. Vats are also used for relish. Both products are gravity-fed to 2nd-floor filling lines packing the sweet pickles and relish items.

New Pickle Routine

Also processed for packing on the 3rd floor are pickles (fresh and salt brine) and relish. For example, cucumbers travel along an inspection conveyor feeding a shaker that discharges into an air-agitated soaking tank. Cucumbers are spray-washed as they're conveyed out of soak tank and into a rotary reel washer before proceeding to a brush-type washer and inspection belt. Washed product moves on to 2nd floor filling lines, with a portion of flow first going through a slicing machine. Excess pickles are diverted to brine tanks in another building.

Pickles from brine tanks are either sliced or unsliced before being transferred to processing on 3rd floor of new plant. Here, they're dumped into a battery of soak tanks, where fresh water is periodically added and removed to extract excess brine from whole pickles or slices. Pickles are then discharged onto a traveling inspection belt for chute-delivery to 2nd-floor filling lines.



JAR FILLING-CAPPING is top-speed operation. Employed are flexible lines that are readily changed to handle a variety of products in different size containers.

Vinegar Bottling

Two-bottling lines—one for pints and quarts, the other for gallons—have been set up for vinegar.

Cases of empty bottles go through an uncaser, whereupon empty cases are conveyed to case-packing, and empty bottles travel single-file through tempering (steam) and washing units to 40-spout filler and 8-head capper. Filled bottles continue through steam box, spray washer, and 4-legged accumulator, then move to 8-head labeler, semi-automatic case-packer, automatic case gluer-sealer, and 4-panel coder.

Operations on gallon line are similar, except that jugs are filled by 10-valve filler and 4-head capper.

Speed of filling lines—from uncaser to accumulator—are adjustable through vari-speed drives. Line operations are pushbutton-controlled by operator from panel located near capper.

Astute Handling

Question: How can a single freight elevator link all filling and case-packing, warehousing, and shipping areas? Specifically, how can this elevator be used to supply cases of empty containers to 2nd-floor filling and take away filled cases to ground-floor warehousing?

Heinz has the answer. It uses four clamp-type lift trucks—two on ground floor, two on 2nd floor—for palletless unloading and feeding of unit loads of cases (empty or filled containers) to belt-roller conveyors feeding and unloading the freight elevators.

Resultant savings in reduced handling are expected to quickly pay for Heinz' new electronically operated

setup. Labor that would have been used for interdepartment handling of cases is released to work on the new system. Other advantages: more efficient production-floor operations, fewer jam-ups, and savings in floor space.

On both floors, conveyor belts have been installed on either side of freight elevator. One belt feeds unitized case loads to elevator and another removes them. Empties are lift-trucked to ground-floor conveyor that feeds them to elevator that carries them to 2nd floor and onto designated belt, from which another truck removes them to filling lines.

"Fulls" are handled in a similar way, except that they're loaded onto 2nd-floor belt that carries them to elevator traveling to ground floor. There, via belt-pickoff truck, they're transferred to storage for a 5-load stacking.

Jam-ups are abolished through use of limit switches and electric-eye circuit breakers operating conveyors and elevator. For instance, when a lift-truck is ready to move a load onto or off of a belt, it rides over a special floor pad which, in turn, activates a limit switch to stop the conveyor. System starts up when truck rides off pad.

On both floors, electric eyes are employed in conjunction with elevator feed and discharge. Thus, in transfer operations, breaking of beams by the loads actuate "first-come, first-served" movements.

Centralized Control

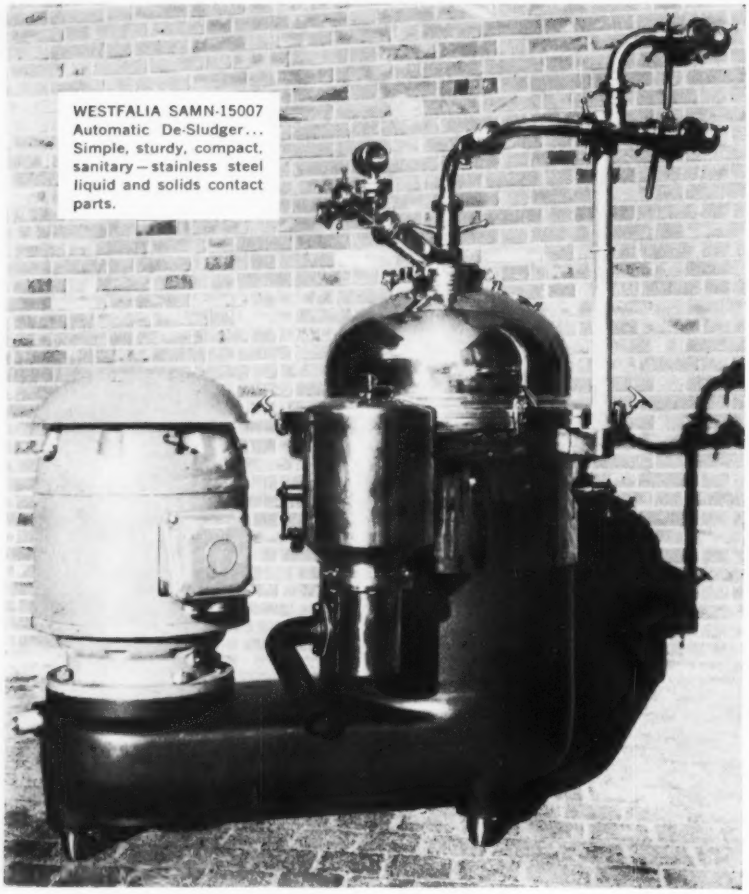
Control centers are located in dry areas of the 2nd and 3rd floor production departments. Equipped with start-stop pushbuttons operating magnetic units, they close and open motor circuits hooked to various processing stations. By centrally and remotely locating these grouped control centers, Heinz has:

. . . **Simplified sanitation,** because control boxes no longer balk hosing operations of the cleaning crew. And there's less risk of damage to controls.

. . . **Saved valuable space** by avoiding old congestion of control boxes in process areas.

. . . **Provided greater safety** by locating controls away from machine operators and wet process areas.

. . . **Eliminated inconvenient "scatter" layout** where there were starters with disconnect switches at each machine. Controls are now more accessible, since units are centralized.—*FE Staff*


WESTFALIA SAMN-15007
Automatic De-Sludger... Simple, sturdy, compact, sanitary—stainless steel liquid and solids contact parts.

"BIG SAM"

for Continuous
High Capacity Clarification

...with Automatic Sludge Ejection

"Big Sam" is catching on everywhere—citrus, grape juice, sugar, coffee and tea, you name it—producing continuously...around the clock...fully automatic.

With "Big Sam" you get: Highest capacity—up to 8000 gph, depending on product...Flexible de-sludging—full or partial, with variable solids control...Compact—controls easy to reach...Simplest design—easiest to assemble and disassemble, no clutch or gears...Sanitary—polished stainless steel surfaces contact liquids and solids...no "entrapment"..."CIP" cleaning possible.

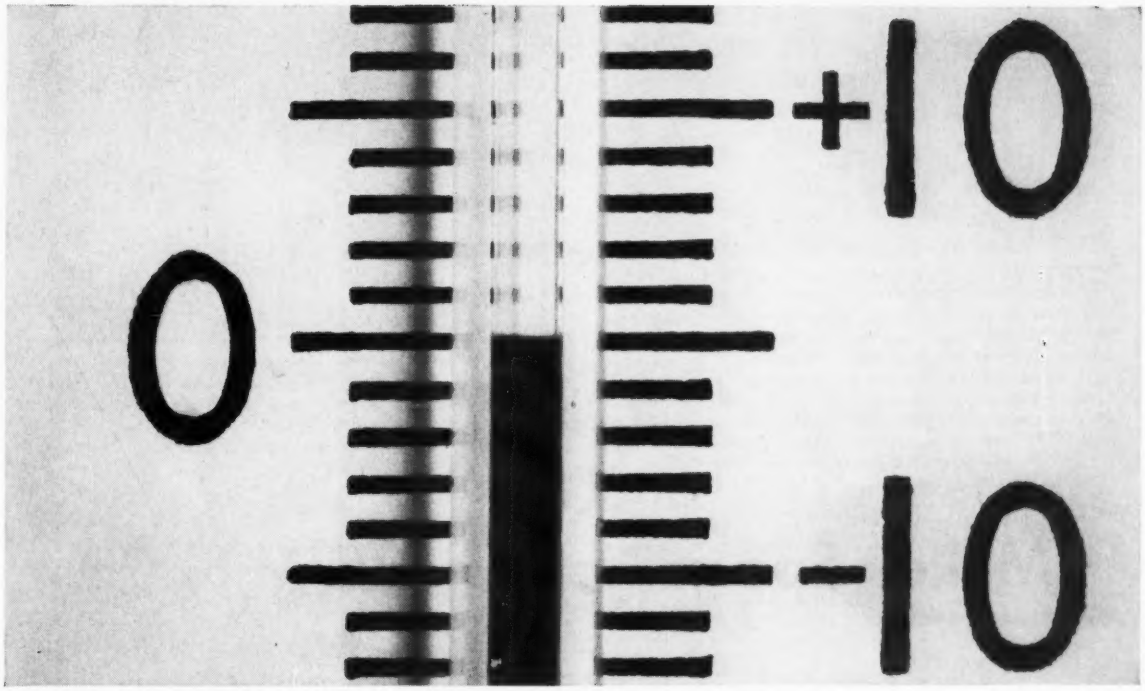
For medium capacities ask for model SAMN-5006.

Write for Bulletin on "BIG SAM"

WESTFALIA SEPARATOR | CENTRICO INCORPORATED

75 WEST FOREST AVENUE, ENGLEWOOD, N. J. • Phone LOWELL 9-0755
WESTERN DIV.: 3315 CAXTON COURT, SAN MATEO, CALIF. • FIRESIDE 5-7065

74 CIRCLE 74 ON READER SERVICE CARD



Zero in on Frozen Foods with genetron®

SUPER-DRY REFRIGERANTS

From packing house to supermarket, actual zero temperature (or lower!) is *always* needed to maintain freshness, quality and flavor of frozen foods and to prevent spoilage. That's why you can't take chances. Whatever way your frozen foods are transported—by rail, truck or on board ship—however they are packed, stored or sold—they need the sure protection of modern refrigeration equipment . . . and dependable "Genetron" fluorinated hydrocarbon refrigerants.

"Genetron" Super-Dry Refrigerants are available from refrigeration and air-conditioning wholesalers from coast to coast. See your wholesaler. Insist on "Genetron" in *all* your frozen food refrigeration equipment!

Quick Facts on "Genetron" Super-Dry Refrigerants

- Guaranteed exceptionally low moisture content
- Noncorrosive to standard equipment materials, nontoxic, nonflammable, stable, safe
- Critical and freezing points well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant; aids in lubrication of equipment; generally miscible with oil
- Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbons meeting the same strict refrigerant specifications

genetron 11 ORANGE LABEL CCl_3F TRICHLOROMONOFLUOROMETHANE
genetron 12 WHITE LABEL CCl_2F_2 DICHLORODIFLUOROMETHANE
genetron 22 GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
genetron 114a BLUE LABEL $C_2Cl_2F_4$ DICHLOROTETRAFLUOROETHANE

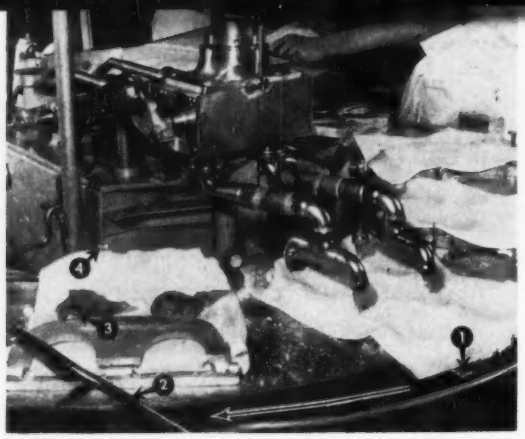
Basic to America's Progress

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

CIRCLE 75 ON READER SERVICE CARD 75

IN ACTION, wheel's production proceeds clockwise from dough-sheeter (right). First, operator lifts dough-square and puts it on 4-pie mold, then table turns, and four spouts (foreground) measure in fillings. Next, hinged halves of mold are automatically closed to fold dough over fillings and, with pressure applied by vertical wheels (left), dough is crimped and trimmed. Finally, mold is automatically re-opened, whereupon operator (left) removes finished pies to rack (rear) ready for deep-fat frying. A newer unit mechanizes the latter steps.



CLOSEUP of automatic mold-closing. As table turns, cam finger (1) contacts and rides upward on bar (2) to close mold-half, folding dough over deposited fillings of outer pair of pies. Finger that's just actuated fold in foreground is seen (3), and one beginning fold over inner pair of pies is indicated (4).

Makes Specialties at 120/Min. Clip

MANUFACTURING

Versatile wheel unit speedily forms, fills, covers, crimps, and trims wide variety of pie items—including pizza and perrogie—for distribution to broad restaurant, caterer, and supermarket trade

NO. 1 WEAPONS for fighting your competition are special products with strong sales potential.

This spotlights the role advanced equipment can play in giving you top performance on such front-line items.

In point is a significant specialty-goods development in the bakery field—where such products appeal to smaller operators because larger operators tend to stick more closely to mass production of heavy volume items.

The new equipment is a versatile pie-forming machine designed and patented especially for the manufacture of turnover pies (up to 120/min.). It is being employed in the plants of Sorority Foods, Inc., in Salt Lake City, Chicago, Los Angeles, Denver, and Omaha.

Utilized is a 15-ft.-dia. wheel-table having a 14-in.-wide working rim to which ten turnover-making molds are bolted. Designed to produce four pies, each mold comprises three parts: The base plate (in which there are four semi-circular sections) and two hinged plates (each with two complementary semi-circular sections that crimp and trim tops of pies). When molds are open, joined semi-circles form four complete circles.

By changing molds, unit will produce filled dumplings (as Polish perrogie, at 60/min.), pizza (about 14/min.), or even conventional-type pies.

Action of the 4-spout, 2-cylinder, volumetric filler (center of wheel) is synchronized with the table's revolutions. It may be adjusted to fill at from 10 to 30 strokes a minute, with each stroke filling four pies. Filler mechanism is built in the base of the 20-gal. filler bowl. Valves, at the bottom of the bowl, open on each stroke of pistons, close on each filling stroke. Unit readily handles fillings having particle size up to $\frac{3}{8}$ in.

The unique dough-sheeter obviates cross sheeting and rolling. This is achieved by the type of gluten flour used; use of knurled, then smooth, rollers; and utilization of a special length of belt (between two type rollers) which permits dough to naturally re-form itself before going through the smooth rollers. Dough is square-cut to completely cover the opened molds.

A $\frac{1}{4}$-hp. motor drives table and filler, while dough-sheeter is independently powered, its production synchronized with requirements of pie-forming unit.

Production of the pies proceeds as described in our photo captions. After final trim, excess dough is recovered to be re-utilized by sheeter. After baking and cooling, pies are packaged in glassine bags.

Perfector of both the new pie former (priced at $7,250) and the dough-sheeter ($2,500) is Sorority, Inc., of Salt Lake City. Headed by G. W. Evans, this organization sells or leases the equipment to bakers and also holds interests in pie-making companies.

Among the latter are the five initially mentioned plants of Sorority Foods, Inc. These supply the specialty goods to area bakeries, which in turn distribute them to restaurants, cafes, supermarkets, and industrial caterers.

Pricing allows the baker-distributor 30%, retailer 20%, and manufacturer 50%. Pies retail for 12-15¢ each. Package design is largely dictated by the baker-distributors, among whom are Continental Bakeries, DeBus Baking Co., and Peterson Baking Co. —*End*

ROBERT BERNICK
Special FE Correspondent, McGraw-Hill News Bureau, Salt Lake City, Utah. (Borg Anderson photos)

CIRCLE 77 ON READER SERVICE CARD→

...flavor by Webb

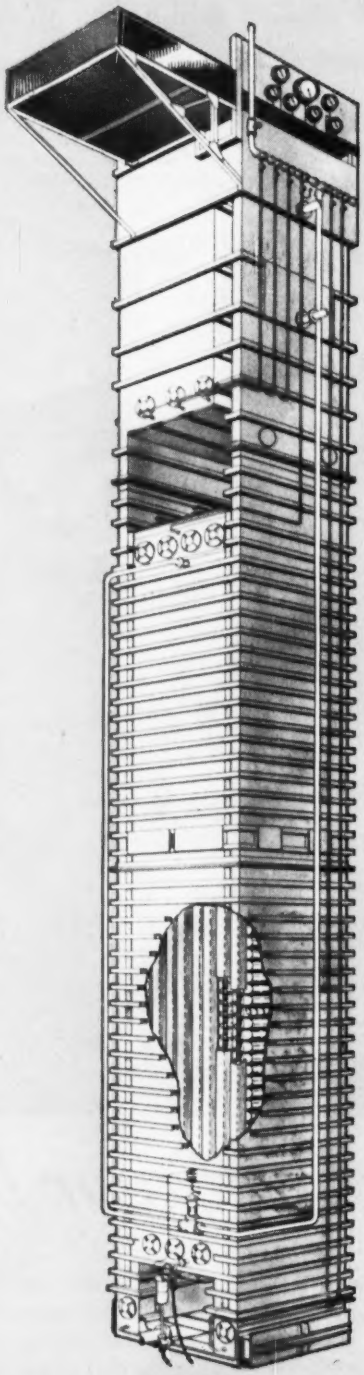
Repeat sales (the best measure of customer satisfaction) begin with quality ingredients.
And you start with a competitive edge when you specify flavors by Webb—
outstanding for trueness, delicacy, uniformity and strength. Specialists in flavors
and custom flavor development for over fifty years. Inquiries invited. Catalog on request.

R. D. WEBB & CO., INC.

MAIN OFFICE: COS COB, CONNECTICUT • BRANCHES: CHICAGO AND LOS ANGELES

Now, from France, for your plant and profits

. . . a sensational (and proved) saving step in canning!



For a long time, continuous pressure cooking and cooling presented many problems in mechanics and heat exchange. *But now, a revolution from France!* Introduced just a few years ago, the genuine CARVALLO hydrostatic continuous cooker and cooler has been constantly tested, refined and improved. Today, it is considered the finest unit in the world, matching your own product quality standards.

Only the genuine CARVALLO hydrostatic pressure cooker-cooler gives you these exclusive features . . .

1. **Preheating and Cooling under Integral Counter Flow** saves up to 80% in steam and cooling water.
2. **Fully Automatic Self-controlled Unit,** directly coupled to seamers and labelers or casers, saves 100% in processing labor.
3. **Specially Designed Chains** are rugged, durable. Do not stretch or wear. The end of the carriers are closed by the chains, preventing jamming and lateral friction and damage to the cans and jars.
4. **Hydrostatic Controlled Pressure** insures an absolutely constant temperature during sterilization, eliminates transfer valves and all their troubles. Pressure variations inside and outside of cans are progressive! No exploded peas! No clouded juices! No leaking seams!
5. **Tubular Carriers Unattached to the Conveying Chains** — the same unit can process, without any change parts, cans, jars or bottles in a wide range of sizes and shapes. No jamming through dented cans or broken jars. Easy automatic loading and unloading. Carriers can be removed very quickly for yearly inspection.

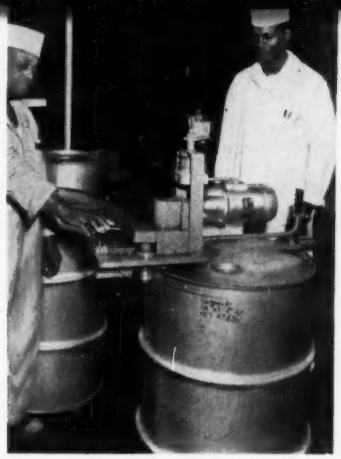
Air mail or cable . . .

MAISON FRÉDÉRIC FOUCHÉ

Food Machinery Department
3, route de Saint Denis,
LA COURNEUVE (Seine)

Built in FRANCE by: Maison FREDERIC FOUCHE 8, rue Eugene Varlin, PARIS 10e

Patented and technically directed by: Pierre CARVALLO 24, villa Dupont, PARIS 16e



2 Steps to Low-Cost In-Plant Handling

ELECTRIC DRUM OPENER quickly removes entire top. Unit cuts through lower edge of double seam, keeps metal filings from product.

SPECIAL HOIST-DUMP elevates opened drum and charges concentrates into pre-mix tank, from which it's pumped to process.

Saves With Sterile Bulk Pack

By using apricot concentrate packed in drums instead of cans, ReaLemon cuts labor, time, product loss—and ups quality

MANUFACTURING

AT TODAY's labor rates, no plant can afford manual work that can be done faster by handling in bulk.

That's why ReaLemon Puritan Co., Chicago, opens and feeds to process 55-gal. drums of sterile-packed apricot concentrate (42-Brix) instead of a dozen cases containing 72 No. 10 tins. Concentrate is used for remanufacture—to prepare the company's breakfast cocktail drink that's put up in 46-oz. cans.

Savings Galore

One man fork-trucks one drum, whereas three men were needed to move 72 cans. And one man empties a drum in about 5 min., compared to 30 min. for three men handling the cans. Loss of product is minimized, for about 5% is left in cans after they're emptied.

Time and labor for disposal of 12 empty shipping cases and 72 cans is eliminated and plant operations are more sanitary.

Storage requirements are reduced by receiving four drums to a pallet and stacking them four pallets high.

Container costs are lower, the savings being passed on to ReaLemon by the supplier, Thornton Canning Co., Thornton, Calif.

Quality improvement and protection are other benefits cited by ReaLemon's plant superintendent, R. J. Van Riemsdyk. "Through use of the new 'hot-fill' process," he points out, "apricot concentrate can be shipped without product darkening. And the sterile-pack concentrate (FE Sept. '58, p. 86) has also improved the color, flavor, and consistency of our finished product."

Part of the success is credited to development of a specially designed 18-gage steel drum (Rheem Mfg. Co., Richmond, Calif.) that permits hermetic packing of the concentrate. To provide protection, drum's interior is electrolytically tin-plated to a thickness six to eight times that employed for tin cans. As a further safeguard, inside of drum's top, bottom, and closure are lacquered. Also, drum's special double seam permits filling of voids with sealing compound to provide a double "O" seam for adequate hermetic sealing and to withstand high vacuums.

Making The Transition

All that ReaLemon needed for in-plant handling of the new concentrate containers were a drum-clamp device, drum flanger and cutter, and electrically-powered dump hoist. Lift-truck's forks quickly slide into the Vert-O-Matic drum-clamp unit (Little Giant Products, Inc.) This device consists of a pair of spring clamps to secure drum.

From storage pallet, truck transfers four drums to dump station, where operator checks each drum for bent flanges and, when one must be straightened to facilitate opening of drum, he uses the flanger (Rheem). Two rollers of this device are locked into top of drum. Then, by pressing a pushbutton, ½-hp. electric motor-driven flanger rotates around top of drum to straighten bent flange.

Next, the ½-hp. electric cutter (Rheem) is lowered into position on top of drum. Cutter's head is adjusted to straddle drum and cut through lower edge of double seam. The rotating blade cuts outside of drum to prevent metal pieces from contaminating product. Lid is then lifted clear.

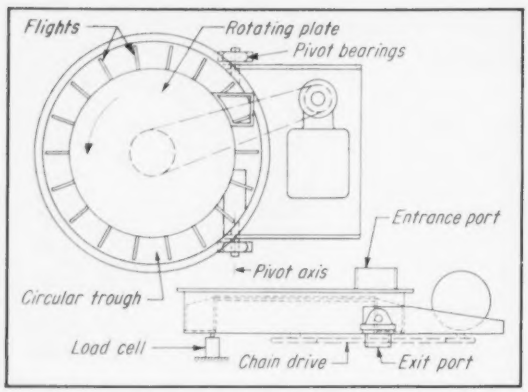
Drum's now ready for dumping. Again fork-truck employs drum-clamp to transfer opened drum to roller-bottomed hoist dump. Drum dumper comprises a ½-ton, 1-hp. electric, brake-operated chain hoist (Coffing) and metal frame against which drum rests.

Hoist elevates drum with aid of a pair of rolls riding vertical tracks. Built-in limit switches protect it from over-travel (up and down positions). Drum elevating and later lowering for empty-drum return are pushbutton-controlled.

When in dump position, drum rests upon a stainless steel semi-circular chute, set at a 45-deg. angle. Concentrate is then charged into a 150-gal. stainless steel pre-mixer equipped with Lightning agitator. Sufficient water is introduced to facilitate pumping to a 600-gal. blender (with agitator). Here, other ingredients are scaled into the batch.

The cocktail drink is then pumped through a tubular-type heat-exchanger (Mojonnier), raising its temperature to 195F. before filling (21-valve Horix filler) at 185F. into 46-oz. cans. Filled cans then proceed through a Canco spin cooler for final labeling and case packing.—*FE Staff*

←CIRCLE 78 ON READER SERVICE CARD



NEW SCALING SETUP receives corn grits right from bulk-storage, weighs them out in precise 7,000-lb. batches, and discharges them directly to cook kettles. Abolished: Inefficient manual bag operation. Saved: 13¢ per cwt of grits.

Weigher Links Bins to Kettles

Astute interposing of scaling-controlling unit streamlines brewer's corn-grit flow into faster, more precise operation . . And change cuts man-hours by two-thirds

ALL IT TOOK to eliminate the excessive, tedious manual handling of corn grits at the plant of Leisy Brewing Co., Cleveland, was installation of a new continuous weigher with gravimetric feed.

But that wasn't all that was achieved with the smoother mechanical batching operation that resulted. In addition, the system has paid off handsomely by—

- ▶ **Assuring more accurate weights** in batching the grits into cook kettles.
- ▶ **Maintaining more uniform quality beer** by greater scaling accuracy.
- ▶ **Saving 13¢ per cwt. of grits** by switching from bag to bulk handling.
- ▶ **Reducing man-hour requirements** by two thirds.
- ▶ **Improving sanitation,** since system is closed and dust-tight.
- ▶ **Cutting down on headspace requirements,** as compared with conventional scale-hopper systems.

A word on the old versus the new will give the picture: Formerly, corn grits were received in 100-lb. bags. These were "set up" by two men, and a third man dumped the grits into a hopper feeding a Redler conveyor (Stephens-Adamson) that discharged into kettles.

In contrast, today's system employs (1) 200,000-lb.-capacity wooden bulk-storage bins, polyester lined, and thus seamless and free of insect-harborage areas; (2) the new continuous weigher (Stephens-Adamson), operating in conjunction with the existing conveyor system; and (3) instrumentation that adapts the continuous weigher for proper batching action.

Details of the new routine:

Grits are picked up from bins and conveyed (a distance of 77 ft.) over a series of 5-in.-wide, horizontal and inclined Redlers. They're then spouted into continuous weigher that charges 7,000 lb. in 30 min. to a 17½-ft. worm-screw conveyor (9-in. dia.) feeding the kettles.

As stated, the continuous weighing setup was modified—making it suitable for batching grits received in bulk form. To do this, a small mercury switch was hooked to a totalizer (reads in pounds) so as to make contact every time a fixed quantity of grits is weighed. Switch is pre-set to shut off flow after any desired number of counts.

Specifically, totalizer is set for 1,400 counts (5 lb. per count), which automatically operates weigher's infeed conveyor to deliver a 7,000-lb. batch of grits into kettle. Once kettle is charged, conveying-weighting system is manually stopped.

Weigher details: Leisy's unit continuously weighs grits while they're in motion. Flow rate is controlled upstream from weigher's entrance port.

Grits are carried counter-clockwise in a circular trough by flights attached to a pivot shaft and plate rotating at 4 rpm. Entire unit is balanced against the load cell. After grits travel approximately 300 deg. at a 40-ft.-per-min. speed along the chain-driven (¼ hp.-motor), flight-mounted plate, they're gravity-discharged through an opening in the bottom of trough and then go into the screw conveyor.

Horizontal axis of bearing-mounted pivot is in line with vertical axis of entrance and exit ports. So unit's accuracy is not disturbed while feeding and discharging grits over its pivot point.

As the material is carried around in its circular path, its weight creates a moment of force about the pivot axis. At any instant, a particle creates a moment equal to its weight and distance from pivot axis. And the total force is equal to the sum of all moments.

A constant velocity is maintained by the weigher's synchronous gear drive, and the pneumatically-operated sensing element—the load cell—measures the force applied to it. The cell then transmits a signal, proportional to the force or weight of grits in weigher, to the air-operated totalizer (in essence the integrator).

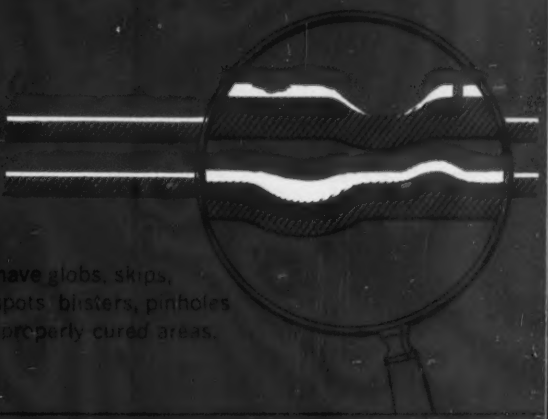
—*End*

CARL E. FROMM and CHARLES S. WOOD

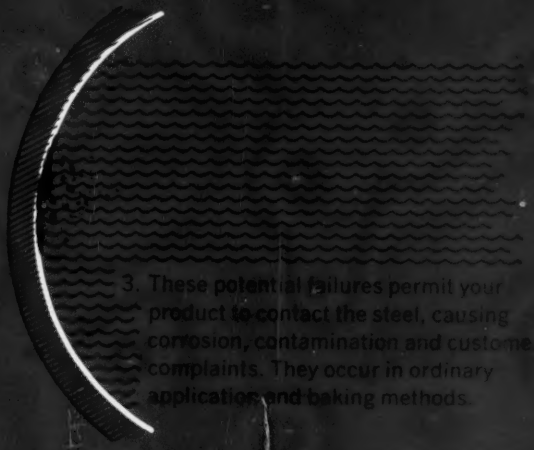
Brewmaster, Leisy Brewing Co., and District Manager, Stephens-Adamson Mfg. Co., Cleveland

CIRCLE 81 ON READER SERVICE CARD→

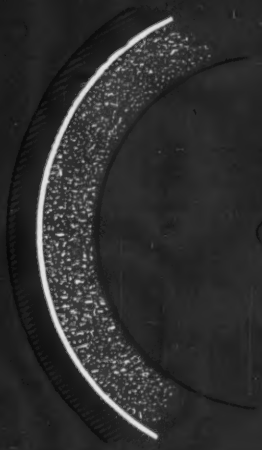
1. The lined drums you buy



2. may have globs, skips, thin spots, blisters, pinholes or improperly cured areas.



3. These potential failures permit your product to contact the steel, causing corrosion, contamination and customer complaints. They occur in ordinary application and baking methods.



4. Rheem Centrifugal Spray leaves nothing to chance. By reducing solvent content, eliminating air turbulence and human error, lining thickness is controlled to 1/10 mil.

5. Then, Rheem Vertical Curing sends drums through ovens upright, rather than horizontally. They act as natural chimneys, drawing the controlled temperature air uniformly over every square inch of lining. Together:

RHEEM CENTRIFUGAL SPRAY, RHEEM VERTICAL CURING assure drums with UNIFORM LININGS

For more than three years, these unique developments have been providing the best in product protection, drum after drum after drum. For more information, or for help in developing a lining for a problem product, write the world's largest manufacturer of steel shipping containers at 1701 West Edgar Road, Linden, New Jersey. Plants across the country at Chicago, Houston, Linden, New Orleans, Richmond, Calif.; South Gate, Calif.; Tacoma. For other sales offices, see the Yellow Pages.

Rheem

GLAZED AND FROZEN trout, individually wrapped in shrinkable Cry-O-Vac, are shipped to institutional markets in 5-lb. cartons. Firm's 10-oz. packages, containing two 5-oz. trout, are sold to retail trade.

Technology Improves Trout

Wrapped in Cry-O-Vac and treated with Acronize and Frodex, fish speed through dressing machine at 1,280 lb./hr. Modern methods mean annual sales booms for Idaho packer

THERE'S NOTHING like a sharp eye on modern methods when it comes to building a solid success.

At the Snake River Trout Co., advanced technology marks every phase of the operation—from hatching to the finished package.

Results: Sales of this Buhl, Ida., firm's 1,000 Springbrand fresh-iced and frozen trout products have jumped an average 20% every year since '54.

Annually, over 1 million trout are killed electrically and processed in the company-designed and constructed automatic dressing machine at the rate of 60 fish/min. or 1,250-lb./hr.

At machine in-feed, operators place fish in banks of four individual plastic molds, belly side up. Separate molds are provided to accomodate large and small-size trout. As fish move through on flexible chain, gills are cut cross-wise and a rotary knife splits the belly lengthwise. Gills and exposed viscera are then removed by a hook and discharged by jet streams of water. A rotating brush removes kidney from the backbone, and additional water spraying completes cleaning.

Consumer preference dictates that fins, head, and tail remain on trout. Entire evisceration takes but 25 sec. per fish.

All trout are portion-packed. They are checkweighed and pre-chilled in 28F. water to reduce body temperature (58F. down to 36F. or colder).

Trout are also treated with Acronize (chlortetracycline), boosting retention of freshness of both fresh and frozen variety (see FE May '59, p. 41). Fish are then packed fresh for iced shipments or further prepared for freezing.

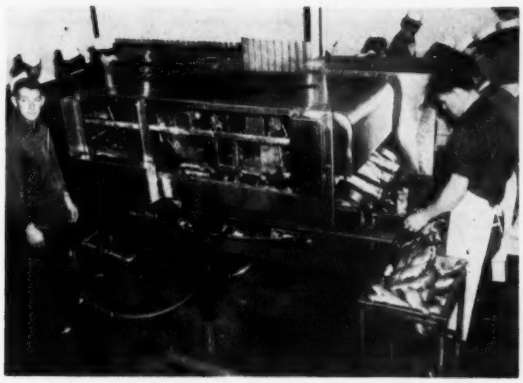
Fresh-iced, Acronize-treated trout of various sizes (4, 5, 6, 8, 10, and 12-oz.) are packed in 5-lb. cartons on same day caught. Brand tags are clipped to gill covers to assure consumer identification of the Idaho rainbow trout. Use of 5-lb. cartons minimizes excessive fish handling, since trout are already weighed and portion-packed.

Fresh trout (iced) make up 25% of total production and are sold largely to institutions.

Company also produces three retail/institutional trout products: (1) Dressed (eviscerated), (2) boned, (3) boned and breaded.

Frozen fish are processed through a blast freezer operating at −40F. and stored at −20F. Only 30 min.

C. R. HAVIGHORST Sr. Associate Editor, "Food Engineering"



AUTOMATIC MACHINE dresses fish. Plastic molds, in banks of four, carry them through on flexible chain. Trout are eviscerated and body cavities washed in 25 sec. Capacity: 60 fish/min.

DRESSED AND CLEANED, trout flow out of machine at rate of 1,280 lb./hr. Gills, viscera, and kidney have been removed. Splash screen keeps water from spraying out of machine.

are required from time trout are seined to completion of freezing operation, thus insuring quality freshness.

Both dressed and boned trout for institutional markets are dipped in Frodex solution for glazing and added flavor protection. Each fish is then individually wrapped in shrinkable sheet Cry-O-Vac.

Boned and breaded variety, developed by company in 1957, has backbone, rib-bones, and fins removed. Fish are individually frozen in open "butterfly" shape, breaded, and vacuum-sealed in Cry-O-Vac bags for packing in regular 5-lb. cartons.

Firm retails 10-oz. packages of (1) dressed, and (2) boned and breaded trout. Each contains two 5-oz. vacuum-wrapped fish. Employed is a 4-color overwrap illustrated with an attractive rainbow trout.

Frozen variety, put up in company-designed and fabricated insulated containers, is shipped by truck or Railway Express. Conditioned by 25 lb. of dry ice, lots are sent from Idaho to Florida in 6 days.

Fresh-iced trout are packed in non-returnable wooden cases and transported via express, usually being re-iced over long distances. Some Shipments running to 10,000 lb. and more are sent by truck.

Adding to its established 4-acre trout ranch, termed the world's largest, the firm acquired two other trout farms. Each year, over 400,000 lb. of live trout from these two hatcheries are brought in tank trucks to the Idaho processing plant.

The Snake River Canyon, from which flows 200,000 gpm. of water, gives the company a natural location for raising trout. The fish, some of which may be hand-spawned, are raised in 50 controlled ponds of varying sizes. Trout are graded into specific ponds according to their growth stage.

Sales are handled largely by brokerage firms, which receive close advertising cooperation. To help build institutional sales, the firm exhibits at seven restaurant and hotel shows each year. —End

"BUTTERFLY" TROUT can be folded back to natural position or left open and breaded. Head and tail are retained for identification.

SHRINK TUNNEL contracts trout's Cry-O-Vac to form a second protective skin.

ACCURATE FILL!

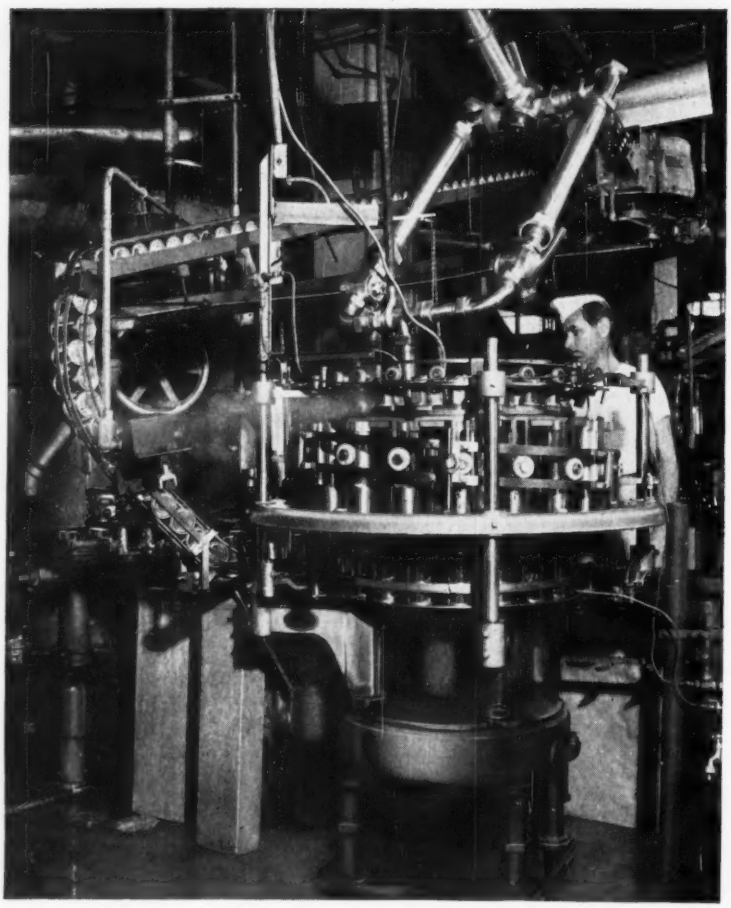
Hershey packs chocolate syrup with a Votator® FILLER

TO HELP adhere to its strict standards of plant cleanliness and efficiency, Hershey Chocolate Corporation recently selected a VOTATOR* Piston Type Filler for packaging of chocolate syrup. Results reported: Fill is more uniform; spillage has been reduced; higher standards and speeds are maintained on a continuous filling schedule.

In deciding on the VOTATOR Filler, Hershey's Laboratory, Engineering and Production Departments studied all types carefully and chose it because, "We thought the VOTATOR Filler would do the best job for us." It is now doing just that.

Why not investigate VOTATOR Fillers for *your* product. See how it can boost filling speed, improve accuracy of fill, reduce spillage. A FULL PRODUCTION RANGE, 6 THROUGH 36 STATIONS. Write for Bulletin PED 260.

VOTATOR—Reg. U. S. Pat. Off.



Hershey packs chocolate syrup in 16-ounce cans at a rate of 300 cpm—18,000 cph with this 18-station VOTATOR *Piston Type Filler.*

Votator®
CONTINUOUS PROCESS EQUIPMENT AND SYSTEMS

GIRDLER PROCESS EQUIPMENT DIVISION
CHEMETRON CORPORATION
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CHEMETRON

CRUX OF FROZONIC PROCESS is treatment of pasteurized milk with sound waves by transducers in rectangular tank (A). Generator (B) produces the waves.

PLASTIC CONTAINERS have proved suitable for freezing and storage. One on left has been torn open to show block of frozen milk.

MANUFACTURING

'Waves' Keep Frozen Milk Fresh

Untrasonic process overcomes separation on thawing, protects fresh flavor, extends shelf-life indefinitely

IT IS NOW POSSIBLE for anyone in any part of the world to enjoy a glass of "fresh" milk.

Credit goes to a recent British discovery whereby freshly pasteurized whole milk is subjected to a special ultrasonic treatment before being quick-frozen under controlled conditions (FE Nov. '57, p. 101).

The frozen product can be stored indefinitely without deterioration taking place. And when thawed it is indistinguishable from fresh milk.

The new process (called Frozonic) is now in commercial operation at plant of Eldorado Ice Cream Co., Ltd., London. It is covered by patents owned by The National Research Corp., London, based on research carried out at the National Institute for Research in Dairying, Shinfield, Reading, England.

Process comprises five main steps:

1. Milk is pasteurized either by batch or continuous process.

2. Then for 5 min. it is treated ultrasonically with radiations having a frequency of 1 megacycle/sec.

3. Treated milk is immediately filled into suitable containers. (Plastic units made from specially selected polythene have been found satisfactory, but sterilized cans can also be employed.)

4. Filled containers are placed in a freezer, ideally a freezing bath containing brine at −20F. Loading on bath is so arranged that the milk is frozen solid in 45 min.

5. Frozen product is stored at temperatures below 10F.

Here's Plant Setup

In a production operation, a plate heat exchanger of conventional design is used for pasteurizing the milk at 300 gal./hr. Milk leaves this unit at 40F. and passes an ultrasonic transducer installed in a special tank in the flow line. From here it continues to a small holding tank above a filling machine. Then it's filled in pt., qt., or gal. containers.

Plastic containers are sealed on a standard impulse heat sealing machine, then conveyed through the freezing chamber. Following freezing, brine is washed off containers with a stream of cold water. Containers are transferred to the cold room operating at temperatures below 10F. If necessary, the frozen product can be stored at very low temperatures, even in contact with solid CO_2 without deterioration taking place.

Surveys have indicated a very large potential demand for this frozen product in areas where fresh milk is not produced. Already regular shipments from Britain are going to the Middle East, and even as far as Hong Kong.

Cost of the product depends on the distance it has to be shipped and corresponding transport charges. In some areas of the Middle East, price to consumers is only slightly higher than that of tinned evaporated milk, although the quality is far superior. This accounts for present and growing demand for the new product. —*End*

W. G. WEARMOUTH

Chief Liaison Officer of National Institute for Research in Dairying, Shinfield, Reading, England. (Photos courtesy *Farmer & Stock-Breeder.*)

Glowing Future Seen

Eldorado Ice Cream Co., Ltd., London holder of the Frozonic license, has been producing ultrasonic frozen milk commercially since last May. Company estimates that production during the first year will reach 100,000 imperial gallons.

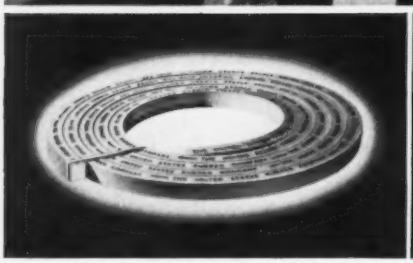
At present, pasteurized milk is purchased from the British Milk Marketing Board. However, company now plans to install its own pasteurizing equipment.

Markets being supplied are in the Middle East, Ghana, Nigeria, and Singapore. Prices vary from country to country and season to season. In Bahren, for exampie, an imperial pint costs 28c., compared with 27c. for whole evaporated milk, and 19c. for concentrated frozen whole milk.

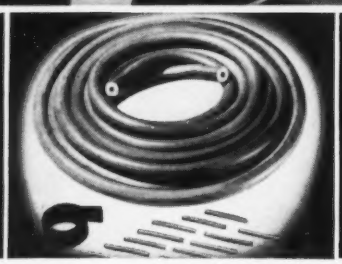
In England, cost would be about 16c., compared with about 9½c. for fresh milk. But Frozonic milk won't be sold in England because there are ample supplies of fresh milk.—*Shirley Kendrick, FE Correspondent, McGraw-Hill World News, London.*

Cooker Door Gaskets

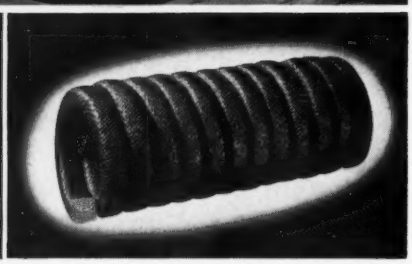
For Hot Cooking up to 350°



U. S. Peerless® Canvas Pump Packing (Style #463) is for use on inside packed pumps against hot or cold water, and for end rings in hydraulic sets. The method of manufacture reduces swelling to the minimum.



U. S. Eclipse® Red Tubular Gasketing (Style #803) is recommended especially for large exhaust heater doors and kettles where a large gasket is needed.



U.S. Rain-Besto® High-Pressure Rod and Plunger Packing (Style #101) handles high-pressure steam and air up to 500 degress F. It has a non-hardening cushion, treated with heat-resistant lubricants and preservatives.

U.S. Cooker Door Gaskets are especially designed for the food-processing industry . . . ideal to use on retort doors for pressure cooking, even up to 350°F. Being chemically inert, they also are fine gaskets for vats and kettles when cooking or processing soups, spaghetti, vegetables, pre-cooked meats, vegetable shortenings, and detergents. In all, U.S. Cooker Door Gaskets provide the food industry with a maximum of cooking cycles, lowering costs by eliminating the need for frequent replacements. Insist on U.S. Cooker Door Gaskets when replacing your present ones.

• • •

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Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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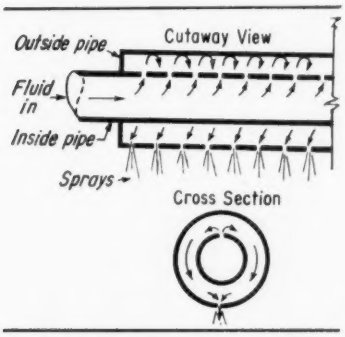
Retreading Cuts Tire Cost

Real value of a tire is in its body, which represents 70% of new tire cost. Friction and heat which are arch enemies, attack body and tread at different speeds. But, depending on type of service, by recapping at proper intervals, good tire bodies have a life expectancy of more than 150,000 mi.

Fleet owners now save 50-75% of new tire costs by retreading. But three out of four passenger owners have never used a retread—about 68 million passenger tires are scrapped each year. Retreading at the proper time will reduce over-all tire cost per mile by at least one-third.—*Purchasing Week, McGraw-Hill Pub. Co.*



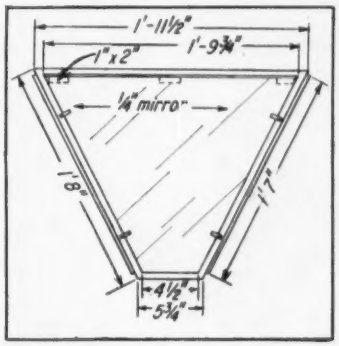
Equalizing Pipe-Spray Flow

To obtain an equal flow through all holes in a perforated pipe, a means of counteracting the fluid velocity parallel to its length must be used. This can be done by grading diameters of spray holes (large to small) along the pipe. But it requires an analysis of flow, velocity, turbulence, etc.

A simple solution is the double piping design (sketch). Fluid enters inside pipe, flows out through holes in its walls into the annular area, then through the spray holes.

To prevent starving the sprays, total area of holes in inner tube should exceed that in the outer. Also, annular cross-sectional area should preclude excessive pressure drop.

Difference in flow between holes at opposite ends is about 2%—compared to that of a single pipe of 15-25%, depending on flow rate.—*R. A. Keppeler, Instructor, Agri. Eng. Dept., Michigan State University, East Lansing.*

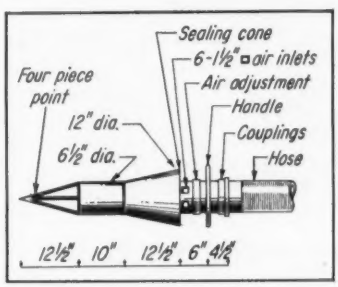


4-Sided Mirrors Stop Truck Collisions

At our 250,000 sq. ft. distribution center, we store merchandise at ceiling height in aisles 7 ft. 2 in. and 10 ft. wide. This, of course, creates some blind cross-aisles—dangerous intersections for fork-lift truck traffic.

Unable to find curved mirrors that would afford drivers a right-left intersection view, we fabricated our own 4-sided ones (photo and sketch) and suspended them 10 ft. 11 in. above the floor. Since they were installed we have not had a collision between two pieces of moving equipment.

Materials used: Four ¾ in. plywood triangles with 1x2 top frame on which are mounted four ¼ in. thick mirrors (1 ft. 9¾ in. x 1 ft. 7 in. x 4½ in.).—*E. E. Clark, Eisner Food Stores, Champaign, Ill.*



Safer Grain-Hose Nozzle

The method required to unload certain types of railroad grain cars was unusually hazardous. It necessitated placing a ladder against the car door, then men or a man had to lug the heavy vacuum hose up and heave it over the top of the door-bulkhead.

To obviate possible falls from a ladder, or physical strains from lifting the heavy hose, we designed and fabricated this "sputnik" nozzle (drawing).

Now, at platform level, knife cuts are made in the corrugated board bulkhead and workmen push the point through it into the grain. In addition to "safetyfying" this job we save ½ hr. per car in unloading time.—*John V. Raab, Plant Production Mgr., V. & M. Schaefer Brewing Co., Albany, N. Y.*

Bags For Iced-Poultry

Two-ply, water-repellent, wet-strength kraft paper bags now replace conventional 90-lb. size crate for local delivery of iced poultry by Columbia Poultry Co., Columbia, S. C.

Changeover brought 4 major benefits: Bags are easily handled, may be

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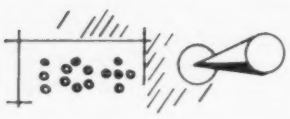
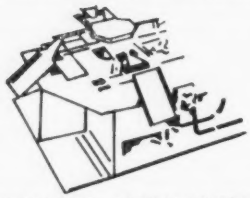
by weight

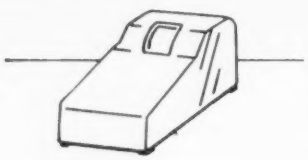
. . . and through electronic controls, performs these and many other remote functions!



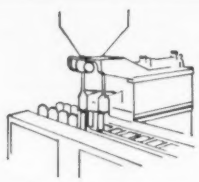
OPERATES SIGNALS



ACTUATES MECHANISMS



RECORDS DATA



CONTROLS PROCESSING

Now you can checkweigh or classify items by weight and utilize the data wherever you need it — and in the form that best fits your needs. The Basic Weight Classifier, employing Shadograph Scale with photocell controls, provides electronic signals which indicate correct weight, or over or under within pre-set limits. Any number of classifications from 2 to 128 may be used. Units are available to handle items in any shape in a capacity range from 2,000 milligrams to 100 lbs. Write for Bulletins 3333 and 3347.

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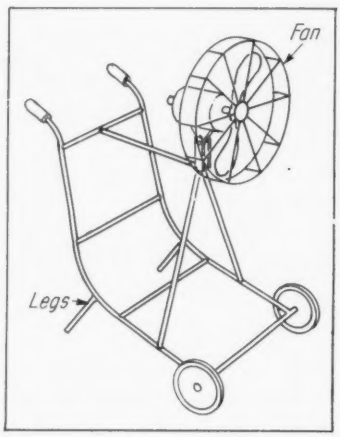
88 CIRCLE 88 ON READER SERVICE CARD

adjusted to size of order, less costly, and require less storage space. Three sizes are available from Union Bag-Camp Paper Corp. for 12½-lb., 25-lb., and 50-lb. capacities. To fill an order at variance with these sizes, the packer merely rolls down bag top for snug fit.—*FE Staff*



Makes Fan Really "Mobile"

No doubt you use small pickup type comfort fans in certain sections of your plant. In some cases, you may haul them around.

It's easy to make your fan truly portable. Just fabricate frames from ½-in. pipe (sketch), mount them on rubber-tired wheels and use bicycle grips for handles. Crutch feet (or pipe legs) are necessary for moving fan along smooth floors. Blades and guards are obtainable from electrical supply houses.

One thing that's very important: Measure your doorways and stairways before making this mobile unit.—*FE Staff.*

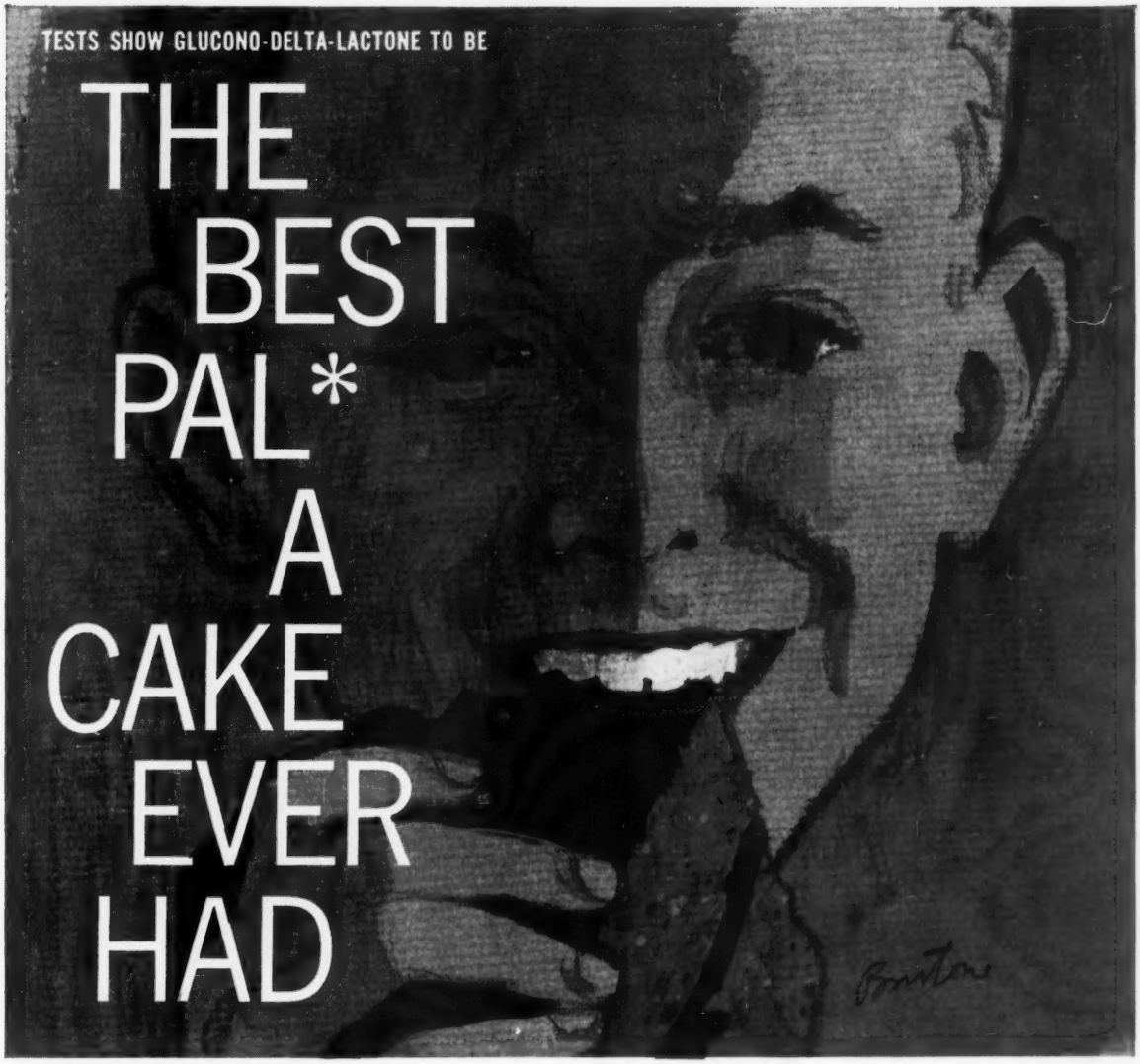
Linen room has individual bins.

Switch to Supply Service Cuts NBC Linen Costs

Easy changeover in the care of employee uniforms from internal control to a linen supply service is saving National Biscuit Co., Chi-

TESTS SHOW GLUCONO-DELTA-LACTONE TO BE

THE BEST PAL* A CAKE EVER HAD



Laboratory and field tests confirm that baked goods leavened with Glucono-Delta-Lactone have a fine, even texture, show excellent volume, and are free of unpleasant aftertaste. To mother, this can mean sure-fire results when she's baking to satisfy happy appetites.

And Glucono-Delta-Lactone offers other distinct advantages to mix manufacturers. G-D-L's observed low level of activity—in storage and at the mixing stage—indicates very little loss of leavening power throughout normal shelf life and only slight release of carbon dioxide during mixing. The gas is developed mainly at the elevated temperatures occurring during the baking cycle—a distinct advantage where a chemical leavening action can be utilized and where long shelf life is a factor.

Investigate the use of G-D-L in such products as CINNAMON ROLLS, RAISIN AND OTHER BREADS, ROLLS, BREAD STICKS AND PIZZA PIES.

Please send me: ☐ G-D-L Technical Data
☐ Suggested G-D-L formulations
☐ A free sample of G-D-L

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* IN PREPARED CAKE MIXES • SPECIALTY MIXES • GENERAL PURPOSE MIXES

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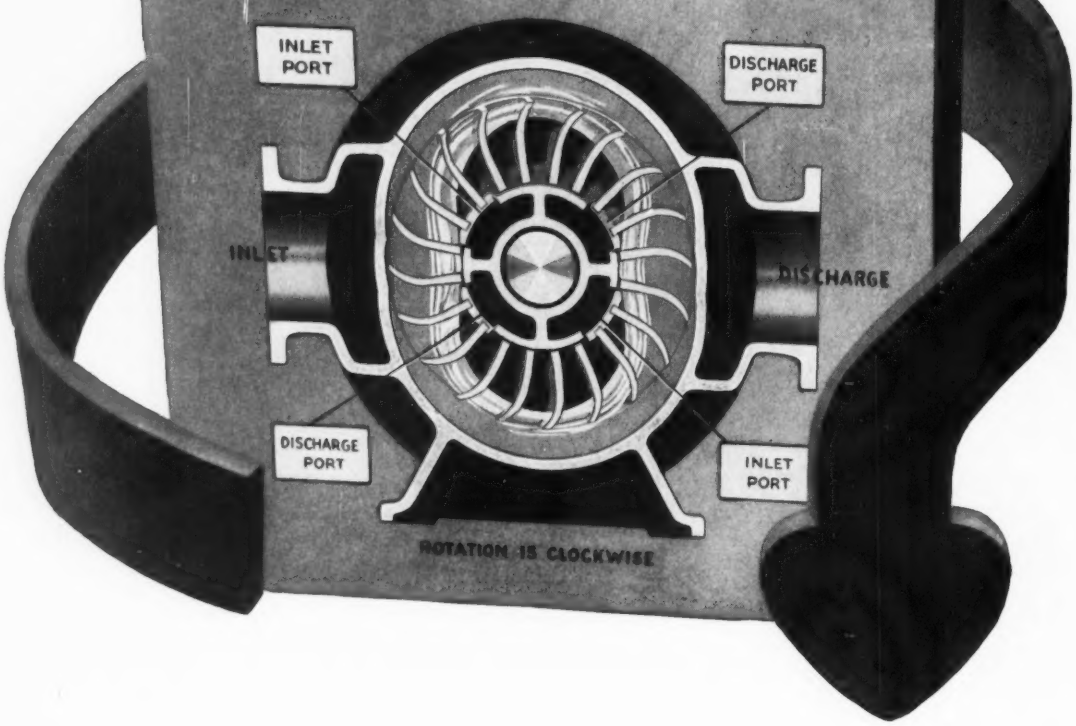
Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters



Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

No oil filters.
No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

NASH ENGINEERING COMPANY
395 WILSON, SO. NORWALK, CONN.

cago, time, money, and floor space.

Previously Nabisco's 111-man sanitation department had been responsible for care of employee linen. Each of the 3000 employees is supplied with 3 uniforms—one to wear, a clean one in reserve, and one being laundered. Actual washing was done by a commercial laundry.

But management considered the operation inefficient, time-consuming, and wasteful. "We were doing a job that we weren't trained to do," says General Manager Henry L. Henderson. So the company turned it over to a linen service. By selling uniforms to the service firm, a sizable investment was liquidated. And the sanitation department was able to spend full time on plant problems. Also, NBC saved 700 sq. ft. of floor space.

Replacement of uniforms became a simple matter. A centrally located storage room contains a bin for each employee. The employee simply turns in his soiled uniform twice a week for a clean one.

Morgan Linen Service provides special uniforms for bakery workers, mechanics and electricians, and cafeteria workers. Cotton towels are supplied for several employee washrooms—even linens for the medical department.—*FE Staff*

Bags Speed Waste Disposal

A special heavy duty, wet-strength, duplex-kraft, disposable bag-liner for 30-gal. cans solves messy disposal problem for food scraps and wet garbage. Used first for disposing of hospital and surgical waste, the bags saved $4500 annually in direct labor cost alone. In addition they lessen need for can washing to obviate contamination and odors.—*Union Bag-Camp Paper Corp., N. Y. C.*

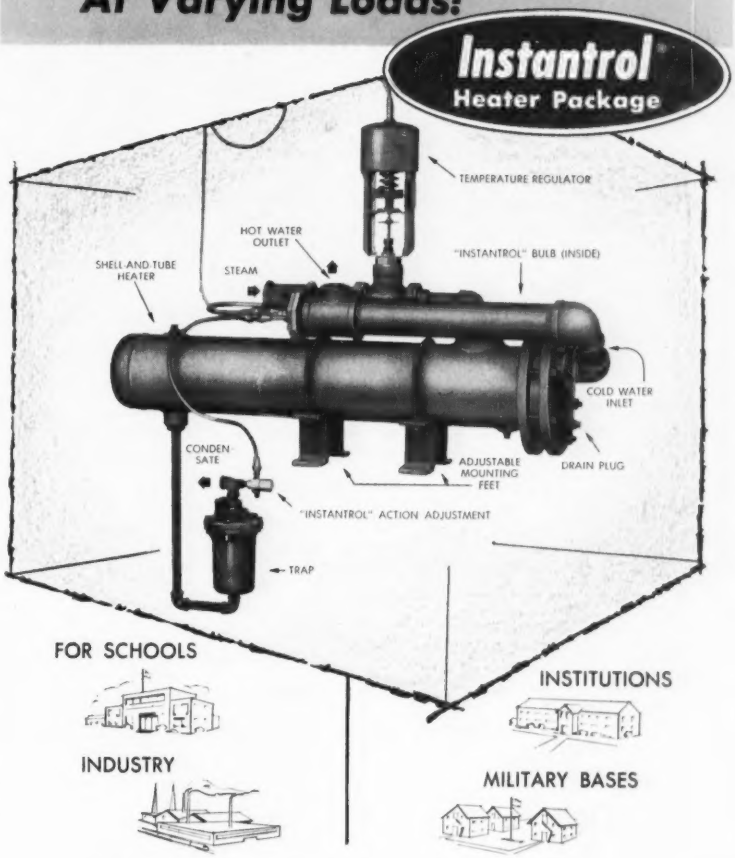
PRACTICAL TIPS

Anti-Freezing Locks. Low temperatures often freeze outdoor locks so it's impossible to unlock them. To avoid this, dip lock in undiluted antifreeze solution. If lock's permanently-installed, dip key in solution a couple of times and turn in lock. One application is enough for the winter.

Greasing Your Way Out. If you use infrared lamps to cook, brown or dry products, you may have had difficulty in removing burned-out ones. Here's an easy solution: Smear a little silicone grease on its base before screwing into socket.

Instant Hot Water Under Perfect Control
At Varying Loads!

Instantrol® Heater Package



Take the cost-saving, space-saving advantages of instantaneous shell-and-tube heaters . . . add *positive control* of heated liquids regardless of peak loads or long stand-by periods . . . and this Instantrol Heater Package is *it!*

The heat-anticipating effect of Robertshaw's exclusive Instantrol® bulb assures extremely close control of temperature, no matter how often or how sharply the load varies. Tight-closing "MA" valve prevents temperature build-up.

Ideal for showers, washrooms, dishwashers, industrial processes and countless other needs, the Instantrol Heater Package is simple in design, ruggedly built, easily installed. Needs as little as 16″ x 50″ floor space, or can be wall-mounted. Standard components, replaceable thermal assembly, adjustable temperature, three standard ranges, temperature control with load "reset."

Detailed specifications free in Bulletin CG-758. **Fulton Sylphon Division, Robertshaw-Fulton Controls Co., Knoxville 1, Tenn.**

Robertshaw

MR. CONTROLS

CIRCLE 91 ON READER SERVICE CARD

TASTY TABLETS: Yeast morsels, coated with sugar to enhance palatability and vari-colored for appetite appeal, are among several forms of torula product turned out for direct—and popular—human consumption.

METICULOUS quality control gets accent in Hsin Ying's excellently equipped modern laboratories. Here, vitamin content of yeast is checked with spectrophotometer.

Free China's Big Protein Project

Vitally needed nutriment is carried by rich yeast products now streaming from model Formosa plant . . . Plentiful blackstrap molasses is economic raw material. Capacity: 40 tons a day

LIKE MANY AREAS in the world, Taiwan (Formosa) is deficient in production of animal and vegetable proteins. The annual import of milk powder and soybeans alone amounts to about 12 million U. S. dollars.

The island has an obligation of increasing protein production to improve the nutrition of the daily diet of the people, as well as the feeds for swine, dairy cattle, and poultry. This problem is extremely difficult because Taiwan's arable land is limited and the population is growing at 3½% annually—every year another 350,000 babies to feed.

Semi-tropical, Taiwan encompasses approximately 13,500 sq. mi. of land—two-thirds rugged mountains. It has over 10 million people, plus 3 to 4 million head of livestock, mainly hogs.

H. C. CHIEN

Manager, Hsin Ying Yeast Factory, Taiwan Sugar Corp., Tainan, Taiwan (Free China)

Production of sugar cane and rice amounts to about 90% of the total crop. But sugar cane and rice contain practically no protein. Required, then, are other food and feed (containing a high percentage of protein, and produced at a fast rate on comparatively little acreage or floor space).

Otherwise, many people and their livestock will suffer severely from malnutrition. They will be starved for protein.

These were the reasons why the modern industrial production of primary-grown yeast was considered a few years ago by a group of Taiwan biochemists, engineers, and economists, and why establishment of a food-and-feed yeast plant was a logical result.

Yeast Supplies Protein

For a long time, yeast has been known as a rich source of proteins that are comparable to milk casein in terms of amino acid content. Also,

GRAPHIC FLOWSHEET →

depicts advanced units now running 24 hr. daily in production of protein-rich torula yeast.

Raw materials are blackstrap molasses, urea, annonium sulfate, calcium superphosphate, air, and water.

Following is the equipment:

1. Molasses purifying units, including dilution tanks, continuous flash sterilizer, and centrifugal clarifiers.

2. Water pumping and purifying system.

3. Air pumping and purifying system.

4. Six yeast propagators (28-ft. dia., 15 ft. height) with necessary temperature, pH, and flow-rate control instruments.

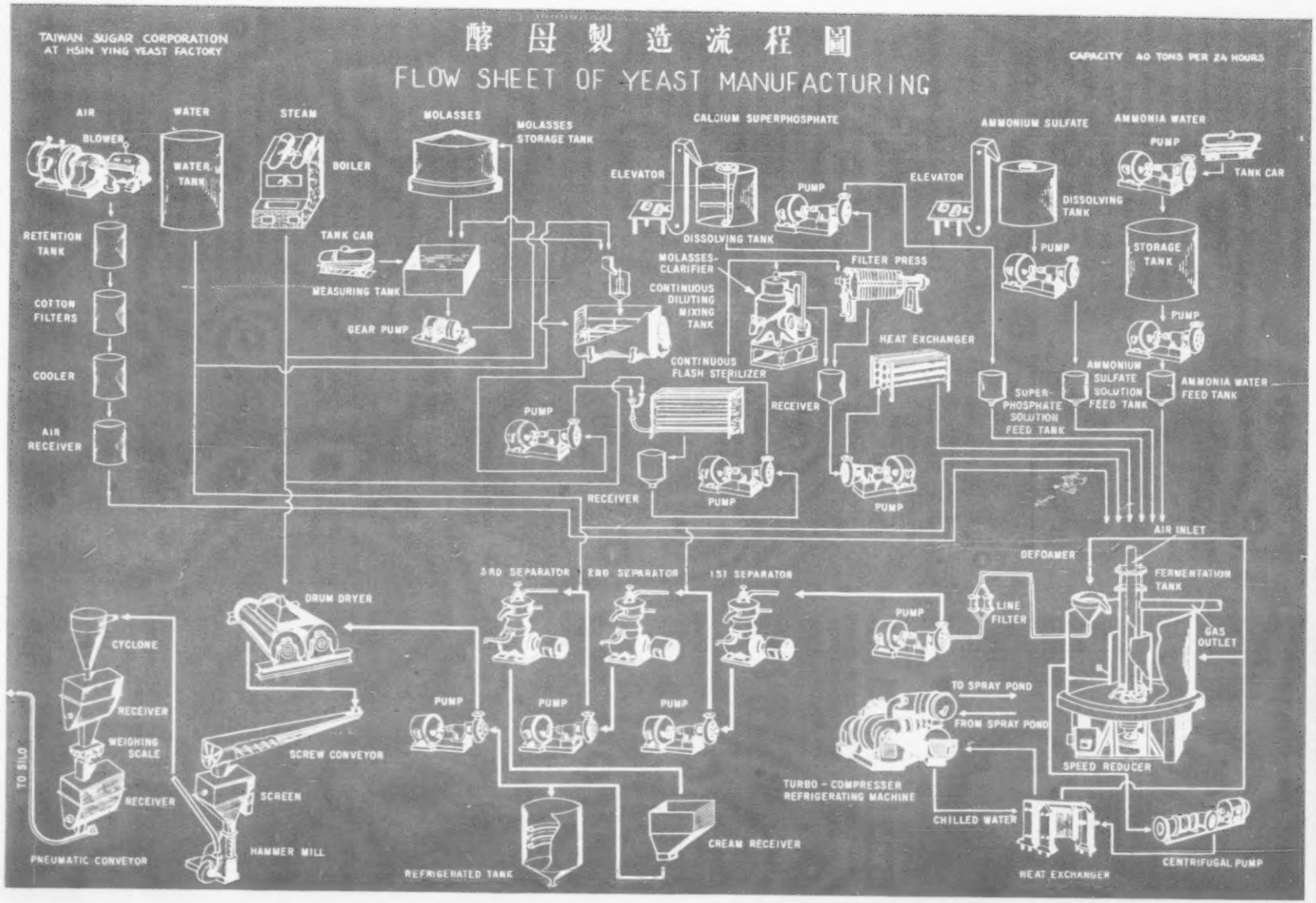
5. Three sets of refrigeration equipment (1,900 tons per day).

6. Eighteen yeast separators.

7. Six double-drum dryers.

8. Blending equipment for mixed feeds and other products.

9. Automatic weighing and bagging equipment.


TAIWAN SUGAR CORPORATION
AT HSIN YING YEAST FACTORY
酵母製造流程圖
FLOW SHEET OF YEAST MANUFACTURING
CAPACITY 40 TONS PER 24 HOURS
AIR
BLOWER
WATER
WATER TANK
STEAM
BOILER
MOLASSES
MOLASSES STORAGE TANK
CALCIUM SUPERPHOSPHATE
ELEVATOR
DISSOLVING TANK
PUMP
AMMONIUM SULFATE
ELEVATOR
DISSOLVING TANK
AMMONIA WATER
PUMP
TANK CAR
RETENTION TANK
COTTON FILTERS
COOLER
AIR RECEIVER
TANK CAR
MEASURING TANK
GEAR PUMP
MOLASSES-CLARIFIER
CONTINUOUS DILUTING MIXING TANK
FILTER PRESS
HEAT EXCHANGER
CONTINUOUS FLASH STERILIZER
RECEIVER
PUMP
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STORAGE TANK
PUMP
SUPER-PHOSPHATE SOLUTION FEED TANK
AMMONIUM SULFATE SOLUTION FEED TANK
AMMONIA WATER FEED TANK
AIR INLET
DEFOAMER
FERMENTATION TANK
3RD SEPARATOR
2ND SEPARATOR
1ST SEPARATOR
DRUM DRYER
PUMP
LINE FILTER
GAS OUTLET
CYCLONE
RECEIVER
WEIGHING SCALE
RECEIVER
TO SILO
PNEUMATIC CONVEYOR
SCREW CONVEYOR
SCREEN
HAMMER MILL
PUMP
PUMP
PUMP
TO SPRAY POND
FROM SPRAY POND
SPEED REDUCER
TURBO-COMPRESSER REFRIGERATING MACHINE
CHILLED WATER
REFRIGERATED TANK
CREAM RECEIVER
HEAT EXCHANGER
CENTRIFUGAL PUMP

CONTENT ANALYSES of 3 Grades of Hsin Ying Dried Torula Yeast

	Food Grade	Special Grade	Superior Grade
Moisture	Not more than 8%	Not more than 8%	Not more than 8%
Protein	Not less than 45%	Not less than 45%	Not less than 45%
Fat	Not more than 9%	Not more than 9%	Not more than 9%
Thiamin mg./100g	15	30	90
Riboflavin mg./100g	5	10	10
Niacin mg./100g	50	100	100

yeast is rich in vitamin B complex. In these respects, it ranks with liver.

During World War II, yeast was grown and dried in large tonnage and used as food and feed in Germany. Since then, similar plants have been built in other countries—as in the U. S. (Wisconsin) and here in Taiwan.

The yeast cell is a self-sufficient living organism that produces enzymes, vitamins, and growth factors. These are needed for maintenance, growth, and reproduction of living organisms, thus yeast is an excellent food for humans and feed for livestock. Important here are—

1. Yeast's high protein production per unit area of floor space. In contrast, arable lands are limited. Per acre, floor versus land, yeast grown in factories can produce a thousand times more food for protein than any cultivated farm crop.

2. Speed of yeast production. Land crops take months from seeding to the harvest. But when growing yeast, we double its number of cells, or double its body weight, every 3-4 hr.

3. Remarkable efficiency of yeast in producing edible protein. Commonly added to soil for land crops are fertilizers (as ammonium sulfate or urea) that are partly absorbed by plants, partly retained in the soil, partly wasted by weeds, and partly washed out by rain. But nearly 90% of the inorganic nitrogen fed yeast during growth is converted into edible protein.

Economic Advantages

In 1955 Taiwan biochemists and engineers decided that a yeast factory could fill a considerable part of the island's protein requirements. It could also profitably utilize the island's cane-sugar byproduct, blackstrap molasses, which often sells at distress prices. Some 30,000,000 gal. are produced annually.

So an unusual economic opportunity was seen if the Taiwan Sugar Corp., a government enterprise, would build a large yeast plant right at the source of supply of the major raw material, blackstrap—thus saving on raw material costs and transportation. Other direct costs, including coal, water, electricity, and labor, would be as low or lower than in other countries. Investment for land and building likewise would be low, for TSC already owned an idle alcohol distillery.

Costs of management and administration, and especially expenses for biochemist and engineer personnel, would be minimal because this facility would be one of the smaller units among TSC's 33 plants (sugar, alcohol, edible oil, antibiotic, pineapple, bagasse board).

The factory would have an assured market, at economic distribution cost, for a large part of its production. For TSC had a distinct need for high-quality mixed feeds for its own annual raising of 40,000 meat-type hogs (sold at premium prices locally and for export). And the plant could also serve local farmers.

Further, TSC plans future manufacturing and marketing of ham, bacon, and other pork products, and then will have attained complete vertical integration.

There were, in addition, TSC's valuable advantage in its research laboratories—which are in the forefront in the cane sugar and cane byproducts field. More than a hundred specialized scientists, many known internationally, are employed.

The well-equipped, modern laboratories at Tainan alone cover 225 acres and house 50 modules with attendant pilot-plant facilities. Costs of research are low, based on the corporation's gross annual sales of more than $100,000,000.

Thus, the plant-designing staff had an expanding source of knowledge and experience to draw upon. And these research facilities now continue to supplement the yeast plant's work in specialized research and quality control laboratories.

Decision to go ahead brought design of a modern torula yeast factory with capacity of 40 tons of dried yeast per day, after initial study of existing factories in Europe and the U. S. and after conducting fundamental research to improve the process.

Chinese engineers constructed the plant at Hsin Ying in 1955-56 at a cost of nearly $2 million, and it went into full-scale production in 1957. Improvements of process and equipment were completed in 1959. Being larger than previous installations, the new plant needed increased aeration and cooling.

Unique Purification

The blackstrap is measured, diluted to a definite Brix, sterilized (continuous flash sterilizer), and clarified (high-speed centrifugal molasses-clarifier). Water is purified by sedimentation ponds, filter ponds, and sterilizing tank. Air, taken from outside the building by high-speed suction fans, is compressed and passed through cotton-filter tanks.

Cane molasses and the other nutrients—including urea, superphosphate and ammonium sulfate, air, and water—are fed continuously into the yeast propagators. From these units, yeast wort, containing 500,000 to 1,000,000 cells per c.c., is drawn continuously.

Heat generated by the yeast growth in the propagators is removed by heat exchangers (absorbed into chilled water pumped from the refrigerating units). Warm water from the exchangers goes to the refrigerating units and final heat is removed by spray pond and tower. During the cooler season, refrigerators are bypassed.

Yeast wort is concentrated by passing it through centrifugal separators. Washed in clean water, the concentrate is then fed to additional separators. Material goes to double-drum dryers, and the resulting powder is screened and blended in special equipment.

Lab Controls Quality

There is rigid laboratory control in every stage. The blackstrap is clarified by a high-speed, recycling centrifuge to assure lighter-color, better-taste yeast. Processed in stainless steel equipment, the wort can be kept low in pH to protect against contamination by undesirable microorganisms and colored materials.

Ingredients and processes are carefully controlled by lab tests. Processing temperature of the wort is constantly checked, also population and condition of the yeast cells in the propagators. Vitamin content is analyzed by spectrophotometer.

Many Valuable Uses

As for the product's attractive properties as a human food, autolysates of yeast have a meat-like flavor that enhances the palatability of many other foods.

Dried yeast attracts and retains water, thus prolongs freshness of bakery products. Also, its antioxidant properties are valuable for preventing rancidity in high-fat foods Preservation of oil-soluble vitamins is also promoted.

Furthermore, dried yeast has an emulsifying effect that is useful in preparing dry soup mixes and canned soups. Because of its high nutrition values, yeast is used in military-ration crackers, canned hash, soup mixes, and many other foods.

Primary-grown dried food yeast is exceptionally valuable for special dietary foods. It is employed by bakers, confectioners, and others, for making cookies, candies, imitation chops, and other food products. In bulk powdered and flake form it is packed in steel drums and multiwall paper bags. Also, consumer packages of tablets for easy eating.

There is no other natural food ingredient possessing so much low-cost nutritional value. And it is our claim that no other manufacturer anywhere can make and offer primary-grown, dried yeast at a lower price than Hsin Ying.

Easy to handle, transport, and use, Hsin Ying's torula yeast is, as noted, primary grown—not a byproduct of a brewery. Our accompanying table shows analyses of representative samples of various grades, all of which are light brown in color and of good taste.

Foods of the Chinese on Taiwan are mostly homemade—very little produced in factories. Hence there is no extensive use of the yeast as a food-manufacturing ingredient on the island. Instead, several yeast products for direct human consumption are produced in the Hsin Ying plant and by other food companies.

As mentioned, yeast tablets are offered, consumption on Taiwan running about 1 ton a day (an average of 0.1g. per person per day). The tablets are sugar coated.

Another product containing yeast is "Nutritive Wheat Flour", in which 2% of dried yeast powder is blended.

Still another product is the yeast autolysate, employed to give a meat-like flavor to boullion soup and such other items as soup mixes, stews, and gravies. Prepared in paste or dry form, the autolysate is an exportable product.

Newly offered are granules made of solvent-extracted soybean flour and yeast—an ingredient for making soy sauce by fermentation and by acid hydrolysis. The yeast raises the vitamin B and protein content.

It is to be noted that in Southeast Asia soy sauce is not a mere condiment. Many families use more than a quart a week. Consequently, these de-fatted granules open a big new market for yeast. They save the edible oil from the soybeans, work against rancidity, and improve nutritional values of the sauce.

Cited as the first special ingredient for manufacturing soy sauce, this item not only improves the quality of the sauce but also reduces manufacturing costs. And it is exportable to sauce makers in other countries.

Variety of Mixes

The large production of yeast on Taiwan (40 tons daily) is being used chiefly as feed. However, its employment as food is very important. Considerable yeast is also exported for food and feed.

For hogs, cattle, and poultry, the Hsin Ying feed yeast is distributed both in pure form and in special-blend mixes incorporating such other ingredients as defatted soybean or other protein material, dried grasses, and feed supplements.

Some blends are pelletized, others offered as coarse grinds. The special blends are "farm-tested" on hundreds of animals at TSC's own breeding stations. Thus, the company determines results obtainable. And the data enable formulation of special growth-stimulating blends of finished feeds or concentrates for large foreign buyers.

SUPER-SPEED SPRAY DRYER is one of research lab's sleek pilot-plant units. It produces ultra-fine powders that directly form colloidal suspensions when stirred into water. Special high-nutrition formulations — such as combinations of the yeast with milk and eggs—are being developed with this equipment.

Strenuous efforts have been made to develop new food uses for yeast in order to direct more of it into human consumption. In promoting consumption, there has been substantial progress, especially by distributing yeast to children They get it in the schools where studies were made proving its high value in increasing body weight and in overcoming the dietary deficiencies of the children, who commonly eat large amounts of polished rice.

These facts make the low-cost Taiwan food yeast of interest to other Far East countries conducting school-lunch programs.

Research continues on development of related yeast products, such as viable dried yeast to be made for foreign buyers.

By mass-manufacturing yeast at low-cost, Taiwan forges a food weapon to fight hunger and malnutrition evils on the island and in other countries deficient in protein.

And by making food yeast more palatable and more acceptable for human consumption, food technologists will greatly increase the power of this weapon —*End*

High-speed STOKESWRAP produces up to 240 packages per minute

Designed to deliver maximum production in minimum space, the new four-tube Stokeswrap can form, fill and seal as many as 240 flexible packages per minute. One four-tube Stokeswrap costs less than . . . yet equals the output of . . . two conventional two-tube units. It is ideally suited for plants where floor space is limited, where increased production is desired and a replacement for obsolete equipment.

Depending on requirements, the four-tube Stokeswrap will form "pillow" or "four seal" types of packages from printed or unprinted roll stock of most heat sealable materials and laminations. Each tube has its own electric eye registration to assure proper positioning of the package design. Either conventional or impulse sealing can be provided with sealing and cut-off achieved in one simple operation. Webs are held in constant tension to eliminate jamming and other troublesome operations.

Capacities range from one gram to three ounces depending on product characteristics. Package sizes can be handled up to 2⅜" x 6¾". Special attachments for strip packaging, gas-fill packaging, coding, imprinting and hole punching can be supplied.

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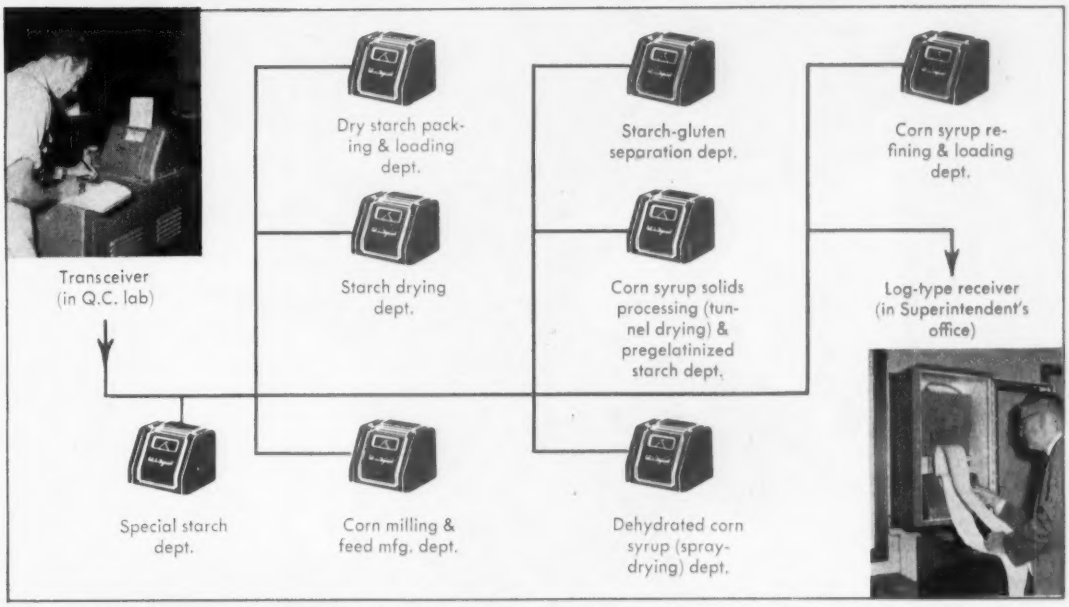

Transceiver
(in Q.C. lab)
Dry starch packing & loading dept.
Starch drying dept.
Special starch dept.
Corn milling & feed mfg. dept.
Starch-gluten separation dept.
Corn syrup solids processing (tunnel drying) & pregelatinized starch dept.
Dehydrated corn syrup (spray-drying) dept.
Corn syrup refining & loading dept.
Log-type receiver (in Superintendent's office)

STYLUS-JOTTED DATA (photo left) is instantly reproduced on any or all receivers in eight remote processing departments, as well as on recording unit in superintendent's office (photo right). Seen transmitting Q.C. results is Lab Shift Foreman Paul Villa, while checking log record is Operations Superintendent Art Hazard.

'Remote Writer' Speeds Vital Data

Positive flashing of lab-test results to production is achieved by American Maize with electronic longhand system, insuring the sharpest checks in maintaining product quality . . . Cite other uses

FOR STREAMLINING operation performance, nothing succeeds so well as high-speed communication of working facts.

This is strikingly demonstrated by our new tight teaming of quality control with production at American Maize, where a system of electronic longhand communication (TelAutograph) now enables flashing of vital data on lab-sample analyses.

Function of the system is to transmit and receive, instantly and accurately, hand-written data on test results via interconnected electro-mechanical transceiver and receivers.

In our case, lab technicians write their reports on the transmitter unit (which is also a receiver) and, by flicking selector keys, simultaneously direct these messages to remote receivers—any of eight key processing departments, as well as to a logging unit in the superintendent's office.

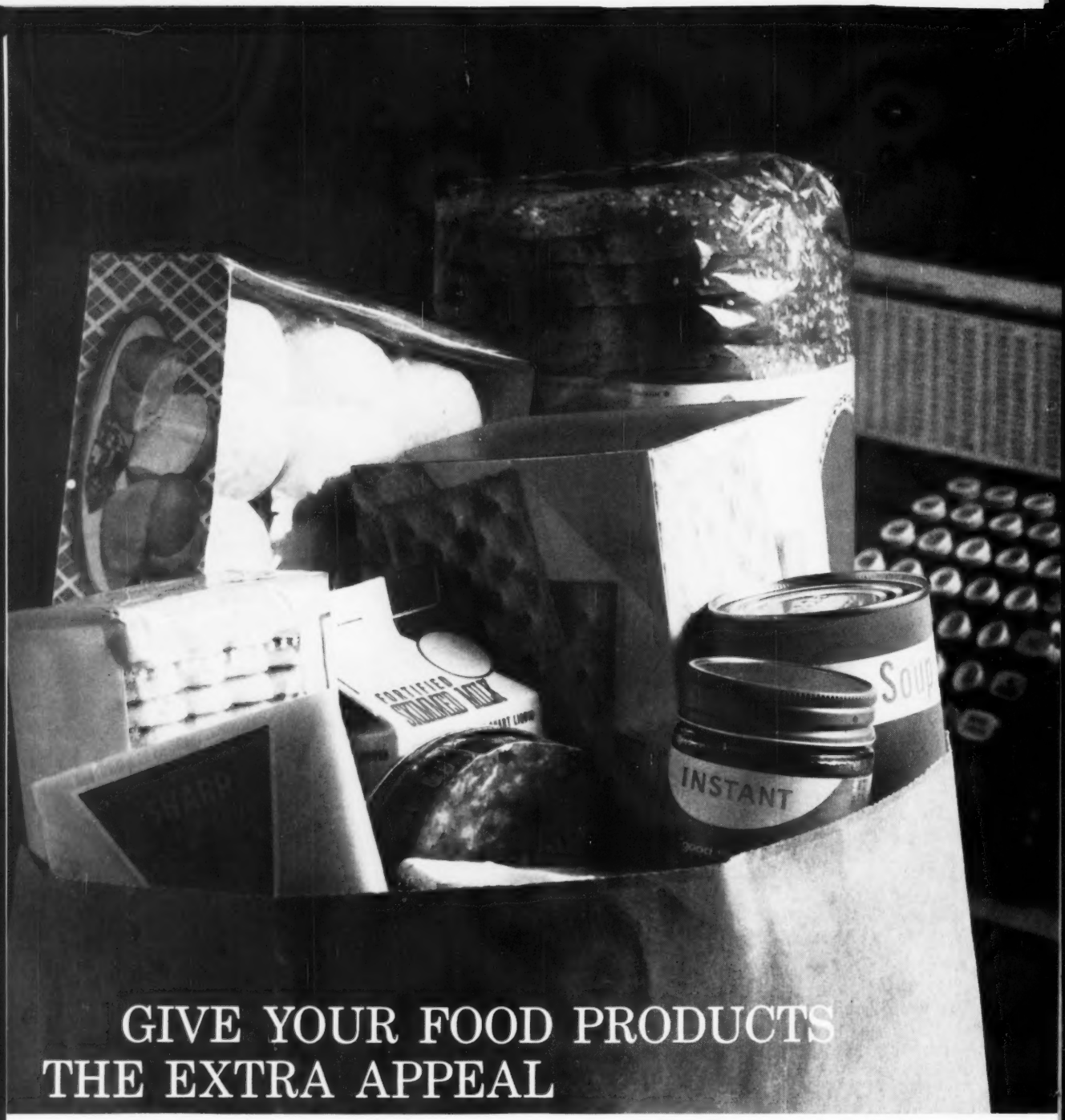
The control lab, as 'round-the-clock sentinel of our product quality and specifications, makes some 1,500 separate daily tests on corn starches and syrups in every step of their production. In turn, the production department is guided by these test results in making needed process adjustments in minimum time, so that the batch, when ready, is approved for movement to the next stage.

It all adds up to several benefits:

. . . **Faster flow of key data,** with less time elapsing between completion of an analysis and receipt of its results at potential trouble spots in the plant.

. . . **Fewer slip-ups and inaccuracies.** Former method of phoning reports sometimes resulted in errors and misunderstood spoken messages, some even forgotten. Present system provides a dependable 3-way flow of data (lab, production, and super's office). Lab sender signs name, date, and hour to transcribed messages, so fixed responsibility results in no kick-backs. Possibility

F. ROY POHNDORFF
Supervisor, Administrative Methods, American Maize Products Co., Roby, Ind.



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Pure milk sugar that will add appeal to all manufactured food products. It is low in sweetness, soluble, free flowing, boosts flavors, absorbs pigments, controls sugar crystallization and offers nutritional advantages.

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Gives food a natural, accentuated dairy flavor. Recommended for fillings, icings, toppings, cheese products and all other formulas requiring dairy solids and a pronounced dairy flavor.

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It whips! Plant tests prove Angel Whip provides superior marshmallows, toppings, fillings and other aerated products.

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A Western exclusive blend of high quality dairy solids. Packaged as a unit to ease your storage problems. Lets you incorporate premium dairy solids in your formulas at lower cost.

For information on any or all of these products, write Technical Service, Western Condensing Company, Department 6D, Appleton, Wisconsin

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of forgetting the messages is abolished, and the communications become permanent records.

. . . **Better coordination of work** throughout scattered departments. As noted, even the plant superintendent is tied in.

. . . **Fewer phone calls** on interdepartment level. Today, there are no delays due to busy phones, switchboard tie-ups, or waiting for phones to be answered by the right people.

. . . **Production savings and reduced downtime.** Lab technicians are no longer tied up on phones, spend more time in analysis work.

Transmitted reports remain on the production-department receivers until noted by the department foremen who act on them. No time is lost in trying to locate plant personnel to relay verbal or written messages to them.

. . . **Smoother operations** during the two night shifts. The new system keeps the night superintendents better posted for carrying out operations. Whereas the day superintendent can call on a sizable staff to aid in making decisions, the night supers make them alone.

Cost Angles

The equipment (transceiver and nine receivers) is leased for less than $250 monthly, following the nominal charge for installing the units. Engineers tailored the system into the plant layout, with cable facilities put in at a cost of $140.

Further, to protect the equipment for long-term, trouble-free operation, American Maize purchased special cabinets to house transceiver and receivers ($1,100 additional). Cabinets are steel-fabricated, are gasket-sealed, and have Plexiglas windows.

After carefully considering the several different types of communications systems available, our company chose this one as incorporating all the special advantages we sought—particularly positive written record, simple installation, and low-cost operation. It is to be noted that the system is also in use at other plants in the corn refining field.

Working Details

Transceiver and receivers are linked by an a.c. wired circuit (110v., 60 cycle). Transceiver sends and receives messages, whereas receivers only receive. Contact is made to any receiver (or group) by transceiver-mounted selector keys, with messages received only by selected stations.

Variety of Uses

In addition to messaging Q.C. lab data, as described here, the electronic longhand system is seen suitable for various other food-industry communication uses, as—

Maintenance . . . Plant and production, notification of troubles, assignment of priorities.

Production control . . . Scheduling, follow-up, expediting.

Material control . . . Requirements and planning, purchasing, receiving, inventory control, shipping.

Accounting . . . Time reports, material changes, customer billing, data transmission, budget reporting.

Sales . . . Order taking, credit authorizations, pricing, sales tallying, delivery information, order filling, shipping instructions, sales reports.

Transportation . . . Dispatching, routing.

—**The Editors**

Equipment operates on a varying voltage principle, with transmitter's linkage system converting mechanical motion of stylus (used by operator in longhand writing) into electrical impulses of varying intensity. These signals go over wires both to transmitter's receiver and to the distant pre-selected receiver, where coils respond to the signal's intensity and reconvert the electrical energy into mechanical motion.

Through identical linkage systems, receiver's pen follows same motions as transmitter's stylus, thus reproducing the messages. —*End*

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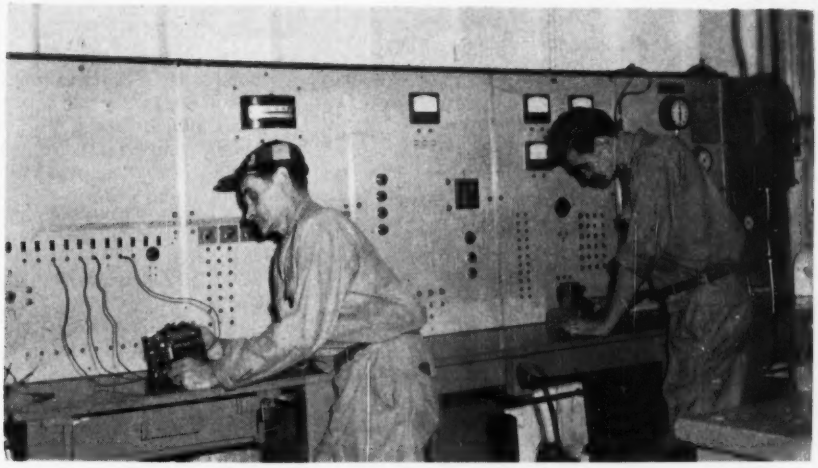

300% BETTER PERFORMANCE is rung up using this special test panel — for maintenance crews now check out 15 components daily instead of merely 3 or 4. Setup permits easy, accurate testing of electrical and pneumatic units removed from control systems. It cost only $450 to install.

This test panel keys Inland's . . .

Smooth Instrument Service

Pre-check maintenance system keeps measuring and controlling units healthy, thus minimizes costly line-ailments . . . Sharp charting and calibrating mark advanced routine

THERE WAS A TIME when instrument maintenance could just be handled "when it came up." But no longer.

In the 1960 food plant, control systems become more complex every day. And this means that new speedy surety in instrument maintenance—with heavy accent on the preventive—is a No. 1 must.

So vital is today's instrumentation that ailments in a single phase, such as pH or density control, can send costly repercussions down the whole line.

Stopped Before It Happens

Engineers of Inland Sugar Co., Chicago, have been specially sensitive to the demands of component maintenance. For this firm has paced the streamlined-instrumentation advance (FE Aug. '58, p. 74).

The problems have progressed from the now-conventional electronic adjustable speed drives and electromechanical servos to such sophisticated systems as program timing of processes. "And," say the engineers, "it's too late if you wait for a failure to give the tip that service is needed. Volume operations demand that trouble be caught and stopped before it happens."

A defective component usually runs on for a time—but not efficiently. This is the cue to start checking. The electrical shop has learned the danger signals. It compares working instrument charts with those on record, also checks recording charts hooked to similar equipment (like evaporators). It even runs on-the-spot chemical tests (like pH and density) to pinpoint suspected malfunctioning.

Quick problem solving to assure longer life for instrument equipment, plus units like motors, coils, and generators, has been the goal ranged by Inland in its preventive maintenance program. And the key prescription is fewer men on repairs, more on checking equipment. Hope is to eliminate almost all emergency repairs, thus minimizing downtime and maximizing control over product quality.

"Why Lug 'Em?"

Before adopting the program, the electrical shop asked a pertinent question: "Why lug test facilities through the refinery to check such things as timers, electronic tubes (over 800), pneumatic and electro-pneumatic controllers, power units, starters, solenoids, switches, relays, etc.?"

In these tedious mobile routines, maintenance crewmen had to make on-the-job air line and electrical hookups to test the components. They even had to check out multi-purpose timers hooked to electrical circuits and keyed to cycle operations.

Panel Proves Solution

This method was too time-consuming and wasn't felt to be sufficiently accurate. This way, the crew could only test three or four components a day, and the company didn't have the manpower or facilities to handle more. Crewmen often had to hurry back to the electrical shop for spare parts and tools—even look up data in technical manuals and in files.

To reduce trouble-shooting and on-the-spot repair time, the company installed a simple, inexpensive

FRANK GERGEN and JOHN V. ZIEMBA

Chief Electrician, Inland Sugar Co., Chicago, and Associate Editor, "Food Engineering"

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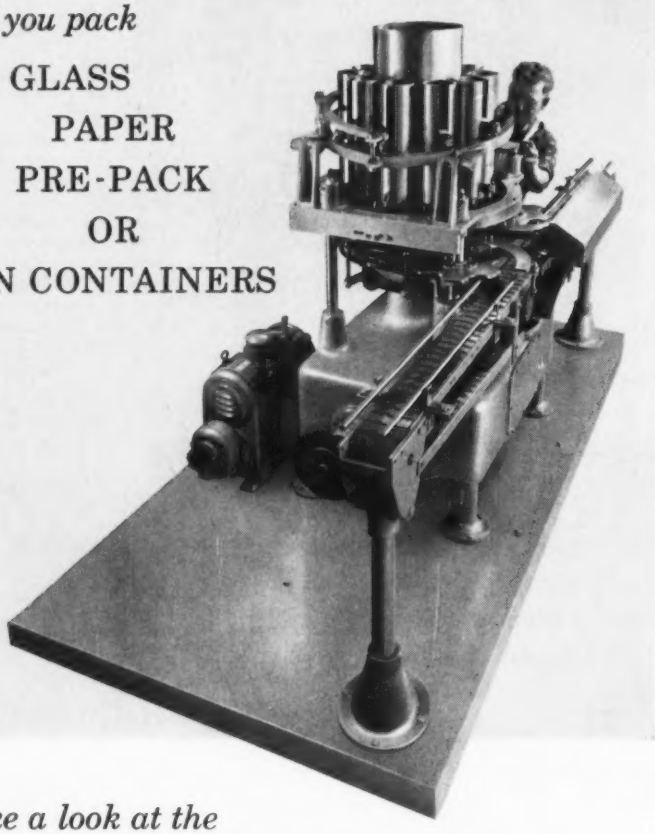

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NEW Pfaudler 10-station filler

With its *continuous through-feed* conveyor driven from the base of the filler, the new RP-210 is ideally suited for stand-up feed of glass, paper, or pre-pack containers.

With *standard can chute* or *infeed* conveyor, the new machine handles with ease conventional tin containers.

In this 10-station rotary piston filler you have a machine that can package products that range in consistency from evaporated milk to potted meat.

You can fill at rates up to 300 per minute (depending on container size and nature of product) with accuracy to ±1/10 fluid ounce.

Standard cylinders come in three diameters—1¾" for 1 to 8 oz. container size; 2¾" for 4 to 16 oz.; and 3¾" for 8 to 38 oz. You can also get a 3¾" diameter cylinder in special design for up to 46 oz.

The through-feed conveyor provides you with a 4 foot infeed and 4 foot discharge. Standard can chute or infeed conveyors of 6 to 8 feet in length are also available.

As with all Pfaudler fillers, you get "simplicity of design" in the RP-210—leading to quick, efficient operation, thorough cleaning, and very little down time.

For complete specs ask for Bulletin 979. Write to our Pfaudler Division, Dept. FE-20, Rochester 3, N. Y. Thank you.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment, and experience in solving problems involving fluids.

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wall-type test panel (3x12 ft.). It consists of six Marbelite panel sections (two divided), trimmed with aluminum strips. Panel sections are differentiated for specific component test and calibration purposes. Sections can be easily removed to replace defective or burnt out parts. Total cost ran to about $450.

This board has electrical outlets for checking:

. . . Over 30 different types of electronic tubes.

. . . Electrical insulation and resistance breakdown of motors, coils, etc.

. . . Timers for shorts, poor contacts, corrosion, etc.

. . . Temperature readings from thermocouples, millivolt pyrometers, potentiometer pyrometers, resistance thermometers, gages, etc.

. . . Performance of motors — grounding, etc.

. . . Generators (10 to 110-v. d.c.) and other d.c. components from multiple-voltage step panel.

Further, the board has a manometer for checking and calibrating gages (draft, velocity, and flow). And there's a panel section for measuring and calibrating air pressures fed into and discharged from pneumatic components.

Today, this in-shop checking center is keeping Inland's measuring and controlling units running smooth as silk. The company has assigned one man to check instruments, five to test electrical units.

Latter units are removed from process hookups for checking in the electrical shop. When thus removed, operations are switched from automatic to manual, with operator checking process performance through recording chart and gages.

This new maintenance system has paid off strikingly in improved performance. During the past year, 15 components (average) have been checked daily, rather than the old 3 or 4. To duplicate this under the old system would have required hiring of considerable additional help, plus purchase of more mobile testing equipment. The savings are being plowed back into electrical shop equipment and inventories.

Often, on-job areas were too cramped for efficient checking. Now there's just simple removal of components for testing at the special central panel under safer, more accurate conditions. Checking is easier, takes minutes instead of hours. In addition, various components are calibrated. —*End*

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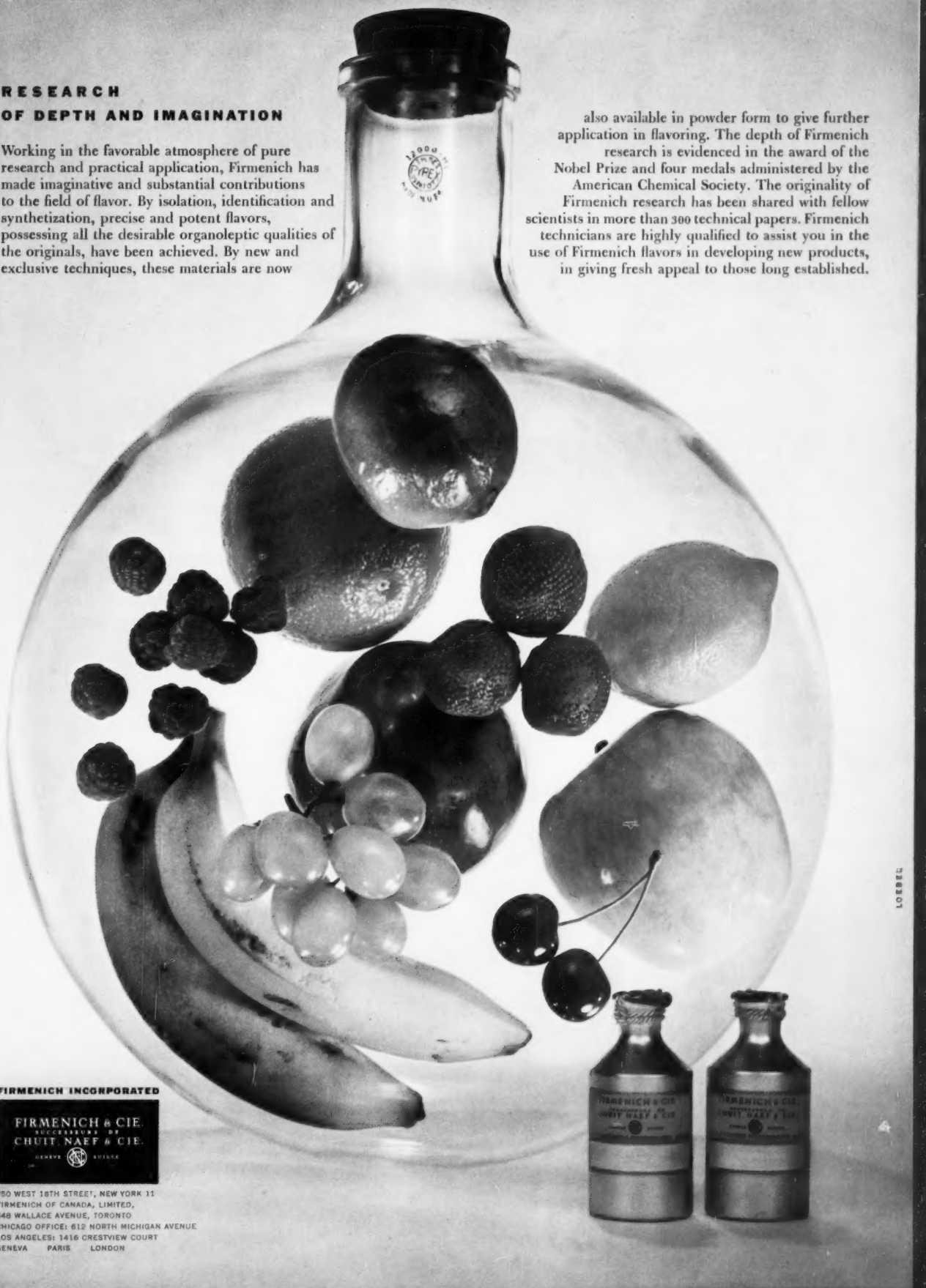

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THE UNCOMMON DENOMINATOR—Other people *make* foil containers; Ekco-Alcoa *creates* them. And whenever you discover a really new and different foil container, you will see the Ekco-Alcoa Plus Container mark. Case in point: bright, new Smoothfoil, pictured below, the first rigid foil container that offers a true hermetic seal (neither air nor moisture can get in or out), opening up a completely new field of packaging opportunity.

This kind of creative imagination, the uncommon denominator among packagers, is the philosophy of business that guides the entire company. This is why Ekco-Alcoa has, by far, the largest line of stock containers in the industry, and is always willing to create a new container for your special applications.

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Ultrasonics Plays Big Role In Egg Freezing Process

Preserving shell eggs by a special freezing process is aim of a recent patent.

Method comprises arranging the fresh eggs in a special rack and vibrating them at low, audible frequencies for 2-hr. at −10F. Eggs are then stored in a freezing environment until used.—U.S. Patent 2,912,335, Nov. 10, 1959.

Bakers' Yeast Fermentation

When the sulfiite oxidation method of Cooper was applied to several sizes of bakers' yeast fermentors, good correlation between yeast yield and sulfite oxidation value was obtained.

But when direct measurement of dissolved oxygen in an active yeast fermentation was attempted by a polarograph, uptake was so rapid that measurements were erroneously low.

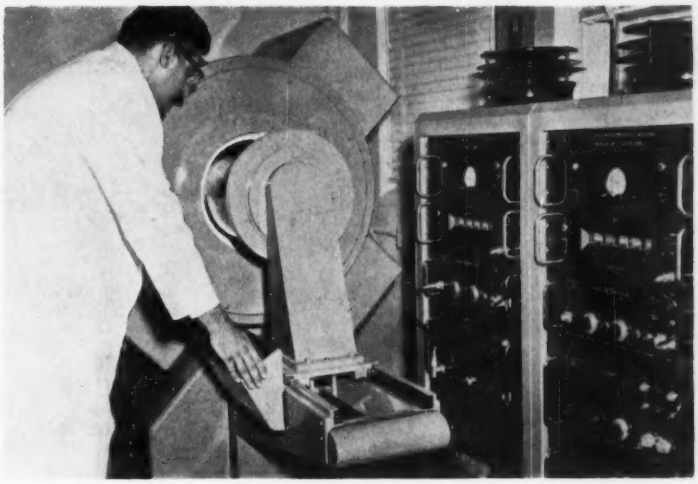
Tests made with pure oxygen showed that less than 10 sec. was needed to consume oxygen equivalent to fermentor liquor saturated with air.—*Applied Microbiology* 7(4), 235-38, 1959.

New Resinous Treatment Cuts Beer's Chill Haze

Recent addition to the list of materials that stabilize beer is Nylon 66 powder. This resin removes anthocyanogens without any appreciable effect on the isohumulone level or foam stability.

Beer is best treated by filtering through a column of Nylon 66—0.15-0.25 lb./British bbl. (0.11-0.15 lb./U.S. bbl.). Beer treated with 0.33 lb./bbl. lost 55% of its anthocyanogens, and about 5 mg. protein per liter.

Effect of treatment on shelf-life was greatest on beers with low air content. Beer bottled with 10 ml. of air and 30% of its anthocyanogens removed showed a visible haze (30 Zeiss units) after 30 days, compared to 10 days in the control sample. Low air (1 ml.) beer similarly treated remained clear for about six months compared to 60 days for the control.—*J. Institute of Brewing* 65 (5), 418-22, 1959.



Radiation Detector Measures Fat in Meat

A new type large volume scintillation counter at USDA's research center in Beltsville, Md. measures gamma ray emissions that occur naturally from K-40 present in animal tissue. Since most of this isotope occurs in muscle tissue instead of fat, number of impulses gives an accurate measurement of the proportion of fat to lean meat.

Detector was developed for AMS to use in work of establishing more objective measurements of food quality. Agr. Research Service is cooperating in work on meat.

One of the major advantages of this method is that, unlike chemical analysis, it provides a nondestructive estimate of lean and fat content. Preliminary work has shown that the machine gives a high degree of accuracy.

Equipment consists of 2 basic units: (1) A 13,000-lb. detector, (left in photo), and (2) two counters (right)—one to measure potassium, the other cesium-137. Meat is placed on a trough in detector and sealed in a central well 14x24 in.

Radiation given off activates a plastic scintillator around the well which transforms the activity into faint light flashes.

These flashes are magnified by 8 photomultipliers attached to the scintillator, then passed along to the counter in form of electric impulses. Number of impulses in given time is proportional to amount of fat.

Counter will be used to provide basic information on difference in K content between muscles in an animal, different animals, and different species of animals. It could be designed to reject automatically any piece of meat that had too much fat for a given grade.—*USDA* 3626-59.

New Knowledge of Fish Gleaned Through GC

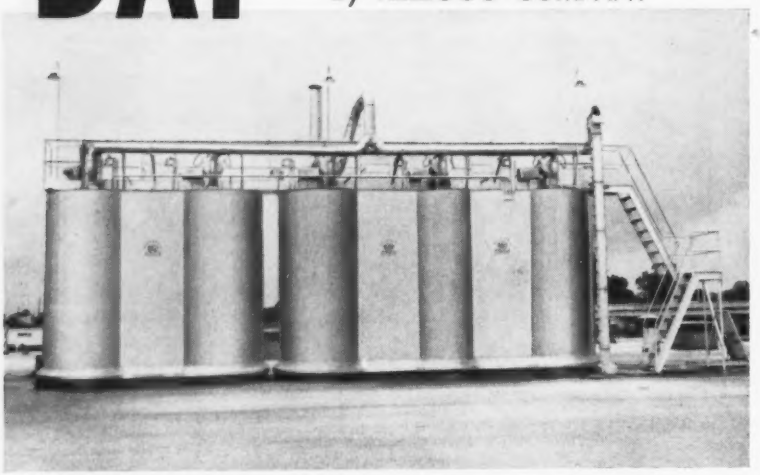
Gas chromatography has been used to study changes in flesh of herring from catching to canning. Fresh muscle contains ammonia and small amounts of trimethylamine oxide, latter showing season changes from about 175/100g. in June, to 250-275 mg. in fall and winter months.

There is an increase of trimethylamine and a decrease of trimethylamine oxide post mortem, during storage at 50F. Ammonia and dimethylamine increase also.

Cooking raises ammonia and trimethylamine to levels that would make uncooked fish unsuitable for use. Thus, while trimethylamine is a satisfactory index of post mortem age, it is not the only factor affecting organoleptic properties after cooking.

Trimethylamine oxide is a potential source of oxygen in canned fish

DAY *plant proven bulk storage tanks used for rice tempering by KELLOGG COMPANY*



Battery of 5 DAY Insulated Tanks Serving Kellogg's Memphis Plant

Rice for America's most popular rice cereal, Kellogg's Rice Krispies, is tempered in this battery of 5 DAY insulated bulk storage tanks. Located in Kellogg's Memphis, Tennessee, plant, these tanks are 8 feet in diameter and 30 feet high. Designed and built by DAY, they are made of galvanized steel and have 3½ inch insulation covered with an aluminum jacket. In addition to these rice tempering tanks and a bulk sugar storage tank, DAY also supplied dust control equipment including filters and cyclones.

DAY engineered, designed and fabricated this equipment for Kellogg. Experienced DAY construction crews made the installation. Because of this type of service more and more companies are seeking DAY advice and using DAY equipment for pneumatic conveying, bulk storage and dust control. They know this equipment is built for their *specific* plant requirements.

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Advances in Technology

that is of greater importance than oxygen in headspace gases. A 14-oz. can of herring may contain trimethylamine oxide equivalent to 75-100 ml. of 0_2, compared to 3-5 ml. in the headspace. In canned herring paste residual trimethylamine oxide is reduced in 3 months, but products formed are not known.—*J. Science Food & Agr.* 10(8), 431-36, 1959.

Irradiation of Soft Wheat Improves Baking Quality

English wheat, irradiated with gamma rays supplied by cobalt-60, at doses of 0, 125, 250, and 500x10³ rads, underwent only minor changes, and none that appreciably affected baking properties of flour made from it.

There was no effect on moisture content of grain or milled flour, water absorption, or granularity. There was some decrease in Amylograph maximum viscosity, and a rise in the Hagberg number, indicating slacker gel formation from greater starch breakdown and increased alpha-amylase activity with increased radiation dosage.

Maltose value, protein content, and distribution of protein fractions were unchanged by irradiation. Dough structure was slightly weaker, and gluten was more extensible.

Irradiation had made the grain more suitable for bread, less suitable for biscuit making. Scores on taste evaluation tests of baked goods showed no significant preference for control or irradiated samples.—*J. Science Food & Agr.* 10(8), 410-12, 1959.

Inert Gas Guards Flavor Of Concentrated Juice

An improved process for preparation of concentrated citrus juices, that employs successive stages of freezing and removal of ice crystals in an atmosphere of inert gas is the object of a recent patent.

Device comprises fully enclosed, agitator-equipped refrigerated tanks, each with associated centrifuge mechanism, plus means of supplying and circulating inert gas to them.

In operation, juice is fed to first tank where it is cooled and agitated to form ice crystals. Simultaneously, gas is introduced through a perforated ring in tank bottom and moves upward to purge CO_2 from the juice, then form a blanket above it. A por-

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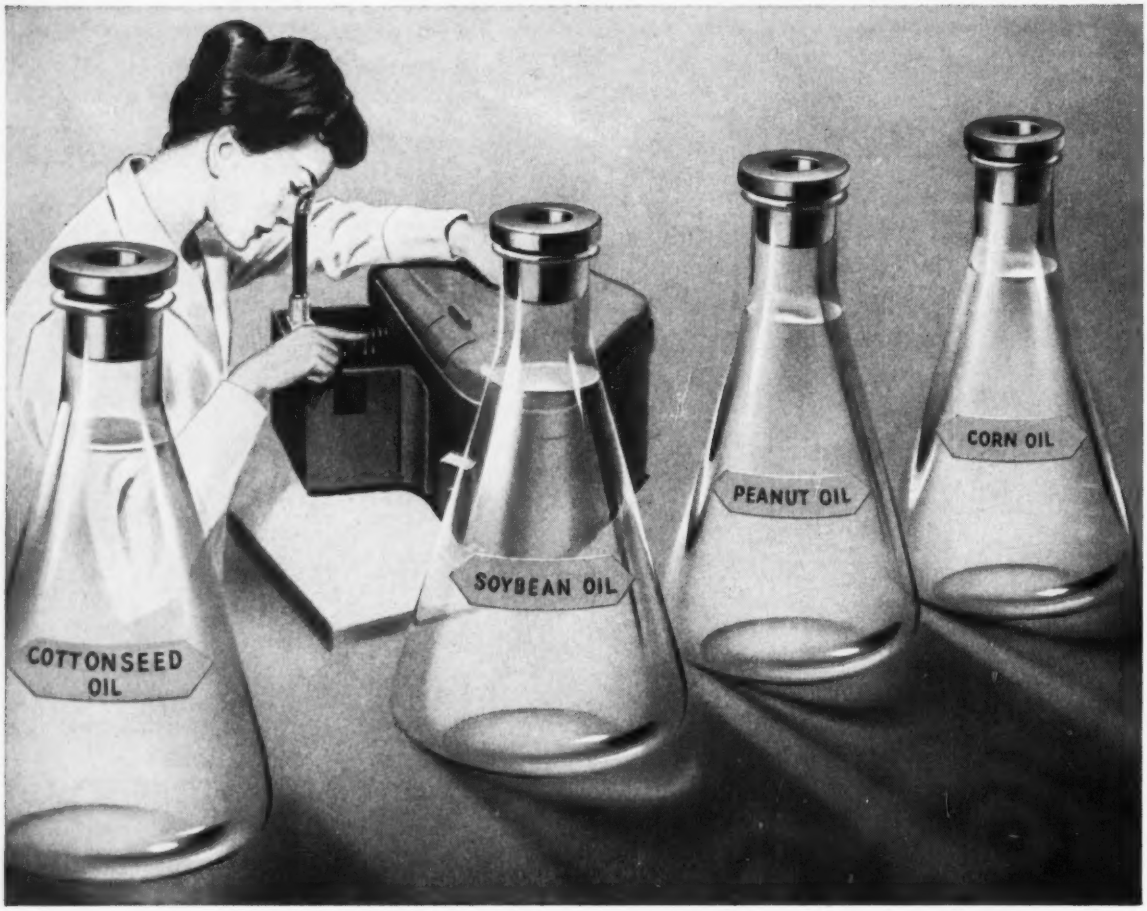

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No matter what type of edible oil you're processing, you'll be sure of the clarity and sparkling brilliance your customers look for with Celite* filter aids. Every cubic inch of these diatomite particles presents over 5,000,000 microscopic "filters" to passing fluids . . . removes the most minute solids and colloidal matter which could otherwise affect clarity or shorten shelf life. And for any degree of clarity desired, Celite gives the fastest flow rates obtainable.

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tion of this gas is then recirculated.

Mixture of juice and crystals drops through special dual valve into centrifuge where (in an atmosphere of the inert gas) ice crystals are removed. Concentrated juice then flows to next freezing tank where more ice crystals are formed and subsequently separated. Steps are continued until desired concentration is effected.—U. S. Patent 2,903,371, Sept. 8, 1959.

Non-Sticky Peanut Butter

Stabilized peanut butter that has good palatability, smoothness, and spreadability over a wide temperature range is the object of a recent process.

Crux is adding to the ground nuts a dispersion of fully hydrogenated fat in unsaturated liquid oil. (Amount of dispersion should equal 10-25% of final product.) Then butter is cooled to 75-80F. and packaged.

Preferred fats are: A cottonseed stearine with titer of 137-43F., and cottonseed oil with iodine value of 110, free fatty acid content 0.02, peroxide value negative. Dispersion comprises 13-18% stearine in 82-87% oil. It is prepared by introducing stearine in the oil and heating to 140F. with agitation to produce substantially crystal-free liquid.—U.S. Patent 2,911,303, Nov. 3, 1959.

Apples With Firm Flesh Keep Best in Storage

Cell structure is key to keeping quality and texture of apples. Latter is also affected by chemical composition, as is flavor.

These relationships became evident when findings from microscopic examinations and chemical analyses were correlated with taste panel reactions. Apples that stored best, such as Delicious and Rome Beauty, had smooth skins of even, well-formed cells. They had a minimum of russet, breaks, channels, or spongy pockets. For example, Delicious with little russet shriveled only 3% in storage, while Golden Delicious with much russet showed 80% shriveling.

Another characteristic of apples that stored well was firm flesh with high concentration of such carbohydrates as pectin and hemicellulose in cell walls. As these complex carbohydrates change to sugars, fruit lose

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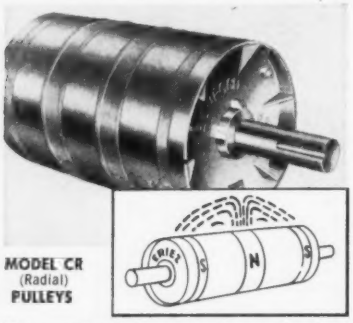

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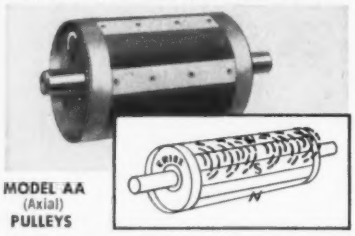
For removing large pieces of tramp iron from heavy depths of flow. Provides a strong, deep magnetic field of equal intensity around the full periphery. 12" through 36" diameters.



MODEL AA (Axial) **PULLEYS**

Excellent for fine iron separation, as well as small and medium pieces of tramp iron, in average material flows! Strong magnetic field of equal force extends across the full width of the pulley. 8", 12", 15", & 18" diameters.

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Advances in Technology

hemi-cellulose and pectin, softens, becomes mealy and sweeter, with loss of flavor.

In cooking, cell walls soften and swell because of changes in these carbohydrates, and the apple becomes more tender. Firmness after cooking may depend on amount and kind of cellulose, hemicellulose, and pectins originally present, and extent of hydrolysis or alteration of these substances during storage or cooking. *USDA No.* 2-150, Dec. 31, 1959.

GC Detects Fat Adulterants

Fat mixtures can be readily analyzed for their component fatty acids by means of gas chromatography. However, it is necessary to hydrolyze the fats, and to convert the fatty acids to their volatile methyl esters.

When sample (one microliter) is injected into gas stream of chromatography unit, a characteristic graph, showing peaks for each fatty acid appears on the chromatograph charts. Such charts have demonstrated presence of fatty acids in fats, not previously known to exist in them, a 20-carbon acid in cocoa butter, for example.

Presence of foreign fats such as palm kernel or coconut oil in cocoa butter can be detected at levels as low as 2%. Curves for pure cocoa butter and substitutes differ clearly in position or height of peaks, sometimes in both.—*Int. Choc. Review*, 470-76, 1959.

Lecithin, Bromate, Soy Flour Improve Lean Bread

Fortification with soy-bean flour improves nutritive value, appearance, and crumb texture of wheat bread made by a lean formula from weak-medium to low-protein flour without milk, sugar, or shortening.

However, additional potassium bromate is necessary to obtain desired loaf volume and crumb texture, and lecithin additions can replace shortening.

A defatted soy-bean flour addition of 6% with 40 g. $KBrO_3$/ton of flour gave satisfactory loaf volumes with either soya shortening or lecithin. Lecithin addition of 0.5% can replace 2% soya shortening. Increased loaf volume obtained with lecithin addition and extra bromate, lightens yellow crumb color due to soy addition.—*J. Science Food & Agr.* 10(8), 449-56, 1959.

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MEN & COMPANIES

Personnel

Lester F. Borchardt has been appointed Managing Dir. of General Mills' Central Research Labs, succeeding retiring **Dr. R. H. Manley.**

Thomas C .Butler succeeds the late **Lansing P. Shield** as president of Grand Union Co.

Victor Conquest, Armour & Co. v.-p., is now European representative, with offices in Paris.

Harold J. Humphrey, frozen food pioneer, has retired from General Foods after 30 yr. service in technical capacities. In March, he will also retire as president of the National Assn. of Frozen Food Packers.

A. D. Donnel announces his retirement as president of Rath Packing Co.

L. R. Fletcher will serve as v.-p. and board member of new White Swan Institutional Foods Co., Dallas, Tex.

William P. McCarthy takes over as executive v.-p. and general manager of Gebhardt Chili Powder Co., San Antonio, Tex.

Frank M. Gardner has been upped to v.-p. of Sealtest Foods Div. of National Dairy Products Corp.

John G. Hinman has been elected treasurer of Thomas J. Lipton, Inc., succeeding retiring **Michael L. Beasty.**

Charles M. Kelly is new sales v.-p. of International Breweries. **William R. Schott** is new board member.

W. L. MacMillan takes over president's post at Woolson Spice Co., Toledo, succeeding **N. L. Schmid,** retired.

Paul G. Miller is new Research Director of Adolph's Food Products Co., Burbank, Calif.

H. K. Philips, new administration v.-p. at Nestle Co., will head organization planning. New marketing v.-p. is **Robert C. Shropshire.**

O. Cedric Rowntree takes over new executive v.-p. post at R. T. French Co. **Clifford A. Hoffmann** is new treasurer.

Dr. R. N. DuPuis

New GF Research Chief . . . Dr. Robert N. DuPuis takes over as v.-p. and director of General Foods' corporate research activities. Encompassed is supervision of Tarrytown, N. Y., research center.

Meanwhile, he will also remain on board of directors of Philip Morris, Inc., where he headed R&D since 1952.

At GF, he succeeds Roy H. Walters, just named v.-p. for corporate technical development. The latter, is his new post, will continue with research activities and also advise the recently-created Corporate Development Council on technical progress.

Appointed new treasurer at GF is E. W. Kelley, who succeeds retiring Bertram B. Warren. And George M. Perry assumes Mr. Kelley's former post as general manager of distribution sales service division.

Roy H. Walters

Thomas H. Sharp succeeds **William M. Noonan** as president of Stephen F. Whitman & Son, Inc. Mr. Noonan is new board chairman.

Howard C. Sheperd and **Augustine R. Marusi** are new directors of Borden Co.

Frank Topham has been named v.-p. and general sales manager of Jack Frost, Quaker, and Arbuckle's brands at National Sugar Refining Co. **A. J. Sievert** is new assistant v.-p.

AT ATLANTA'S FULTON BANK...

Model PS-20BP battery powered Clarke-A-matic cleaning floor in main lobby of Fulton National Bank, Atlanta, Ga.

Marketing Endorsement . . . With a $4 million investment in new plant facilities just completed and further expansion scheduled to be launched in the near future, Mars, Inc., is taking giant steps in increasing candy manufacturing volume.

But, says James R. Fleming, new president and chief executive officer, "This expansion requires a well-rounded, well-organized, and thoroughly experienced marketing staff." He believes Mars' realigned marketing organization "is highly qualified to meet the challenges of the future."

Firm has shuffled several executive responsibilities in view of the increased volume.

"Fair merchandising practices and public respect still remain our two most important ingredients," he added.

James R. Fleming

E. F. Schroeder

Two New Presidents . . . Major appointments in Corn Products Co. organization move Emerson F. Schroeder in as president of CP International and Hugh M. McKay into similar post at Refined Syrups & Sugars, CP affiliate.

Mr. Schroeder succeeds James A. Moffett as head of International, which maintains processing and packing facilities in some 20 foreign countries. Retiring President Moffet will continue as executive consultant and a director.

Mr. McKay takes over reins at Refined Syrups from Frederic A. Davidson, who retired at the end of last year. Mr. McKay is a member of the board and formerly served as general manager.

In other CP moves, E. Prescott Barker becomes treasurer of Refined Syrups, and Frank E. Glotfelty succeeds Mr. Schroeder as manufacturing chief at International.

Hugh M. McKay

Industry

Armour & Co. and Swift & Co. are co-recipients of Industrial Science Award of American Assn. for Advancement of Science.

Ward Baking Co. has assumed ownership of **Bell Bakeries, Inc.**

Firmenich & Co., flavor producer, has inaugurated new research labs in Geneva, Switzerland.

Chock Full O' Nuts Corp.'s Pres. William Black has donated $5,000,000 to Columbia University for a medical research building. **Hunt Foods & Industries Foundation** has given $200,000 to city of Fullerton, Calif., for a new library.

Campbell Soup Co. is purchasing **Kia-ora Industries, Ltd.,** Melbourne, Australia.

Gebhardt Chili Powder Co., now merged into **Beatrice Foods Co.,** will operate as an independent div., according to Gebhardt Pres. T. Arthur Lambert.

Gorman Eckert & Co., Ltd., Ontario, Canada, and **McCormick & Co.,** Baltimore, have consolidated.

ClarkeAmatic DOES A 16 HOUR JOB IN 45 MINUTES

Before placing the Clarke-A-matic self-propelled floor maintainer on the job, four men worked four hours to clean the 7214 sq. ft. of terrazzo floors in Fulton National Bank's main lobby. The floor was cleaned only once a week—a total of 16 hours labor time.

Today, the floor is cleaned in 45 minutes by *one* man with a Clarke-A-matic, reducing labor time 15 hours and 15 minutes each time the floor is cleaned, which, according to Fulton Bank's calculations, is a labor saving of 95 percent.

In addition, a better housekeeping job is accomplished and customers are provided with a safer, more sanitary floor. The floor is now cleaned *three times a week.* These three cleanings, requiring 45 minutes each, total only 2¼ hours—saving 13¾ hours each week.

Put briefly, Fulton Bank's Clarke-A-matic does three times the cleaning for less than one-seventh the former cost.

And one more thing: Clarke-A-matic gets floors clean. Instead of just moving dirt around with a mop, it scrubs, picks up and dries—all in one pass—and leaves floors sparkling. And, the Clarke-A-matic is self-propelled—ideal for cleaning large floor areas in any institutional, commercial or industrial building.

All these Clarke-A-matic advantages and savings can be yours!

Ask to have your Clarke distributor tell you how many hours and dollars you can save with the right size and type of Clarke maintenance machine. He'll gladly prove it by putting the machine through its paces on your floors.

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FLOOR MACHINE COMPANY

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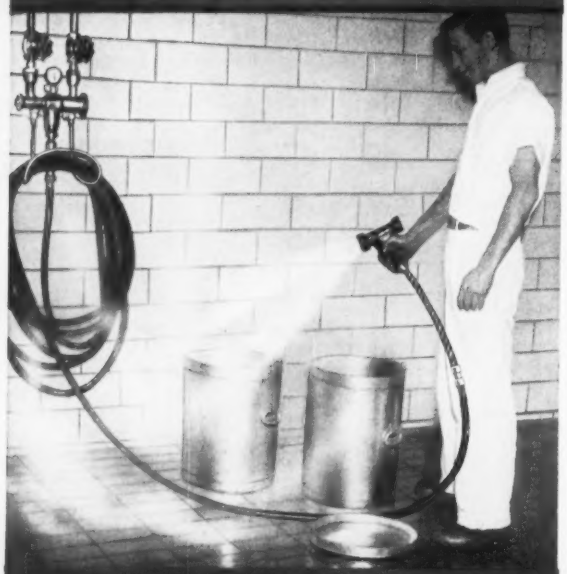
Steam Burns!



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Equipped with 50 foot hose, water saver and spray nozzle. Mixes Steam and Cold water with no chance of Steam Burns! Economical and easy to use.

The Strahman Instant Hot Water Maker, built of Bronze and Stainless Steel, is designed to make it possible to do a better job with a minimum amount of water. Recommended pressures: Water, 50 to 80 lbs.; Steam, 80 to 150 lbs.

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Associated Industries

Allied Chemical Co.'s National Aniline Div. Sales Manager Arthur T. Schramm has been invited to serve on the UN's Export Committee on Food Additives.

Bennett & Chase, Inc., has been formed by C. Ralph Bennett and Edward G. Chase, both long active in food advertising.

Chicago Apparatus Co., lab-equipment supplier, has acquired **Heil Scientific, Inc.,** 93-yr.-old St. Louis firm.

Clark Equipment Co. is sponsoring an essay contest with a "Mechanize to Modernize" theme. American Materials Handling Society will conduct competition, designed to highlight modern handling methods.

Continental Can's Hazel-Atlas Div. will build a $1½ million R&D lab in Plainfield, Ill.

Food Service Engineering Corp., Philadelphia, has appointed N. Bert Persson as new v.-p.

Girdler Process Equipment Div. of Chemetron Corp. has named John E. Slaughter, Jr., as new plant manager.

Goodyear Tire & Rubber Co. announces a 50% expansion in Vitafilm production.

Henszey Co. has completed a pilot plant at Watertown, Wis. It will be available to industry as a general research and development aid.

Manning, Maxwell & Moore has organized a subsidiary in Fribourg, Switzerland.

Weyerhauser Co., Boxboard & Folding Carton Div., has appointed Thomas J. Schaefer as Sales Manager.

Deaths

Lansing P. Shield, 63, president, Grand Union Co.

Arvid M. Erickson, 60, v.-p. of Midland operations, Dole Hawaiian Pineapple Co.

Joseph Husson, consultant on food fleet operations and anonymous author of some 200 FE truck articles.

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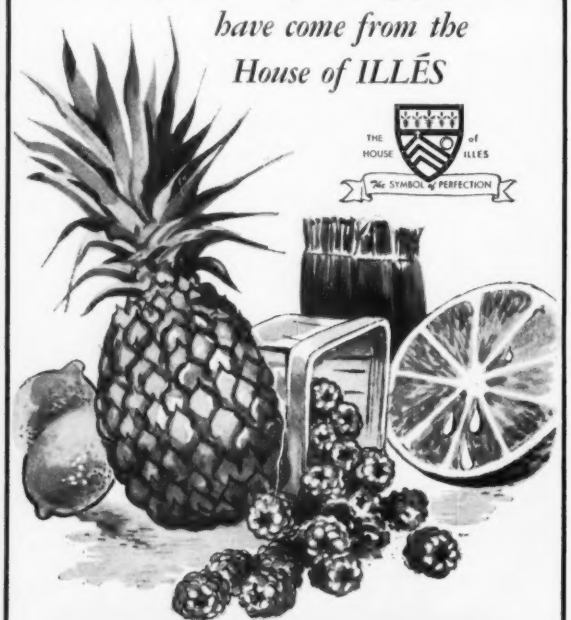

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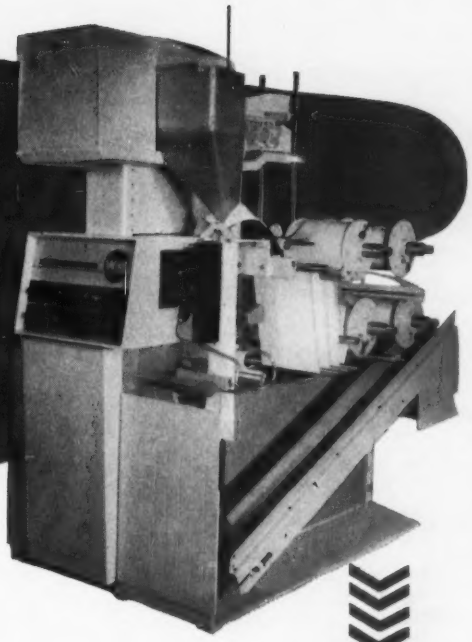

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Automatic Packaging System For Fragile Free-Flowing Products

A new concept in machinery for producing pillow-type packages now brings the tremendous savings of complete automation to manufacturers of fragile, free-flowing products.

The Wright Advanced Bagmaster produces up to 50 full packages per minute of even such difficult-to-handle products as potato chips. The bag is formed from roll stock, product is electronically weighed, filled, and package sealed.

New, fully integrated Hytronic weigher assures precision accuracy. Material stock rolls can be reloaded without stopping the processing line. Packaging material and product are kept separate from the machine's mechanical parts for maximum sanitation.

For complete details you are invited to use the coupon below.

Literature Available Upon Request . . . Mail This Coupon

WRIGHT MACHINERY COMPANY
DIVISION OF SPERRY RAND CORPORATION
DURHAM, NORTH CAROLINA

Send me details on your Advanced Bagmaster System.

NAME & TITLE.....

COMPANY & ADDRESS.....

.....

PRODUCTS.....

DISTRICT OFFICES:
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LaGrange, Ill.
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EXPORT:
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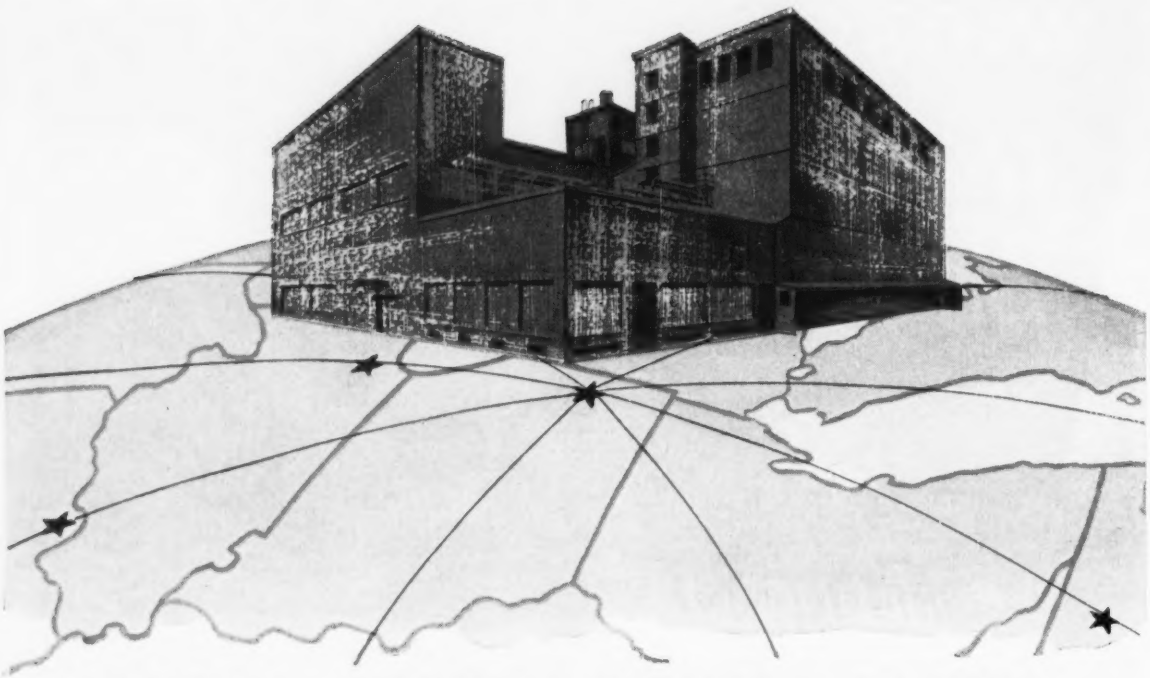

MILES...CLOSER TO YOUR PLANT

new basic source of citric acid U.S.P. is centrally located

Whatever you're looking for in citric acid . . . superb purity, swift service, or a reliable source . . . there are good reasons for getting better acquainted with Miles Chemical Company in the near future.

First of all, Miles citric acid U.S.P. is produced at a convenient Midwest location (Elkhart, Indiana). Rail and truck service in any direction . . . in *your* direction . . . is remarkably fast. The expanded plant capacity at Miles assures an abundant, ever-ready supply of citric acid which can be started to your receiving dock or siding within hours after your order is placed.

What's more, Miles citric acid is exceptionally pure. Years ago Miles started its own production of citric to fill its needs in producing pharmaceuticals. So Miles pioneered a unique deep fermentation process to yield a product meeting the most rigorous purity and mesh specifications.

By purchasing Miles citric acid you, too, can take advantage of this rigorous control. *We would like to talk with you about supplying your requirements and specifications.* A Miles Chemical representative can be in touch with you within a few days after we receive your inquiry. Please write.

Miles Chemical Company

division of Miles Laboratories, Inc.
Elkhart, Indiana
Telephone: COngress 4-3111

FE SERVICE CENTER

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Patents ..... p. 146
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Advertisers' Index ..... p. 152
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NEW EQUIPMENT & SUPPLIES

Electrostatic Deodorizer

Compact, cabinet-type electrostatic deodorizer is new unit offered for expunging odors in food plant areas.

Maker states equipment uses electronic system that, in effect, "burns out" unwanted elements in air. No filters or chemicals are employed. Economical maintenance is cited, since unit requires only "light bulb wattage."

There is choice of a number of models to fit specific requirements. —*Morris Deodorizers, Inc., 2819 Broadway, N.E., Knoxville, Tenn.*

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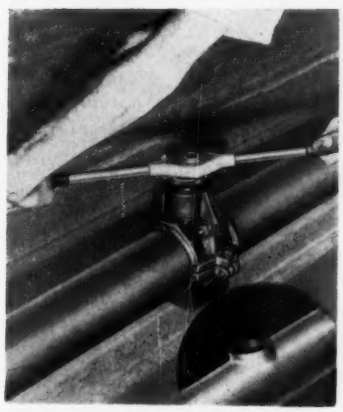

Makes Tees in a Jiffy

Getting a new "tee" in your copper piping is simple when you apply the new Pipemaster Tee Turner. It will cold-draw a tee (such as shown in photo inset) in less than 5 min.

Particularly applicable on water distribution and drainage lines, device can be used on installed conduits without their disassembly.

Tool handles tube sizes ranging 1¼ to 4 in., including DWV, M, L, and K.—*Erie Tool Works, 735 W. 12th St., Erie, Pa.*

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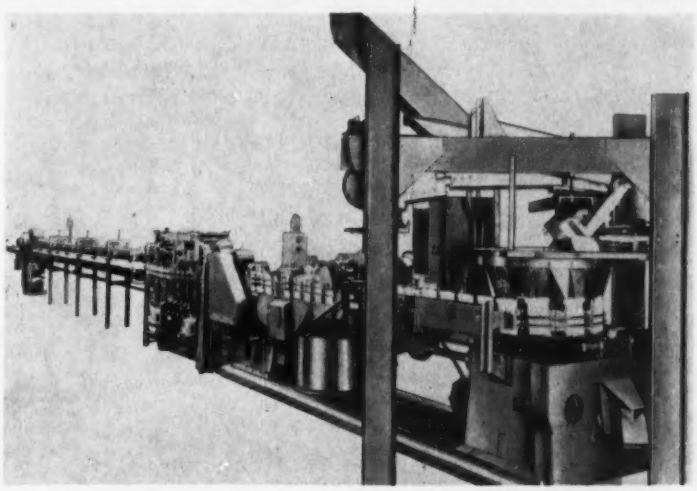


Equipment setup

Speedy Packager Eliminates Inner-Bags, Overwraps

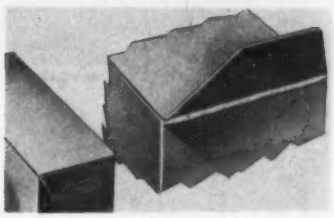
This fully automatic high-speed unit is designed to open, fill, and seal cartons at 300/min., for daily output to 130,000 packages.

Key in accelerated performance is elimination of need for inner-bags and overwraps—enabled through use of the new Calk-Seal carton (Packaging Corp. of America).

Resulting single-structure box is suitable for cereals, potato flakes, milk and dessert powders, and other hygroscopic products.

In the special sealing (detail photo) there is hot application of beads of thermoplastic caulking under carton's top and bottom "Van Buren" ears. Then when edge tabs are folded over and sealed, soft ribbon of Calk-Seal is pressed into narrow openings, making a good moisture barrier at these traditionally weak points. Seal further guards against sifting and infiltration.

Models are offered for packaging powders, granules, and flakes. Maker says that end-opening cartons of practically every type can be handled, from small 1 oz. up to 3 lb. sizes, with dimensions from 2¾x3¾ up to 8x11 in.—*FMC Packaging Machinery Div., 4900 Summerdale Ave., Philadelphia.*



Calk-Seal details

Circle 311 on Reader Service Card

Space-Saving Scale Beam

A slim new scale-beam outfit is specially designed for use in tight-space areas of packing plants and cold storage warehouses.

Available in both shelf and pedestal models, unit has enclosed back balance that assures maximum accuracy and sanitary protection. Full

BAG DAMAGE ENDS... when you begin packing with CLUPAK* paper multiwalls

NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

New CLUPAK paper offers multiwall buyers a happy choice . . . Because CLUPAK Extensible Paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. So by specifying CLUPAK kraft bags, you can solve your breakage problems once and for all. And CLUPAK multiwalls fill faster, palletize better and handle easier. For special handling problems, CLUPAK multiwalls can be supplied with a rough outer-sheet to provide far better anti-slide protection for your product.

Millions of CLUPAK paper multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of CLUPAK multiwalls as part of your next bag order. See the difference for yourself. Your customers are sure to like the extra service of a better, more dependable bag . . . and so will you.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority. Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.

center reading and twin bright-red graduations speed weight readings.

Outfit also may be installed in room separate from lever system for added space-saving. — *Howe Scale Co., Rutland, Vt.*

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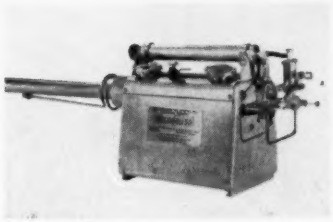

Portable Insect Fogger

New insecticide fog generator produces a dense cloud of dry insecticide without messy and dangerous residues.

Unit operates on low-volume application principle—less insecticide to cover wide areas—for added savings in time and money.

Portable generator weighs 16½ lb. and is 52 in. long. Powered by regular gasoline and having only one moving metallic part, unit needs only minimum maintenance.—*Curtis Automotive Devices, P.O. Box 297-7, Westfield, Ind.*

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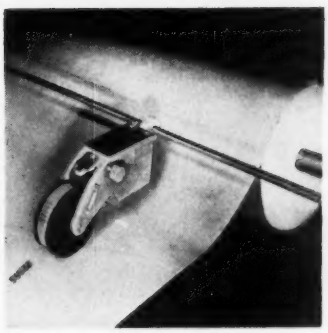


Coder Marks Any Surface

Either continuous or intermittent marking on any surface is possible with this positive friction driven coder.

Sheets, boxes, and rolls may be marked in areas ¾x12 in. and up. Coder has long-run ink fountain and adjustable spring tension.

Interchangeable rubber type and strips are provided for quick re-sets. —*Algene Marking Equip. Co., 232 Palisade Ave., Garfield, N. J.*

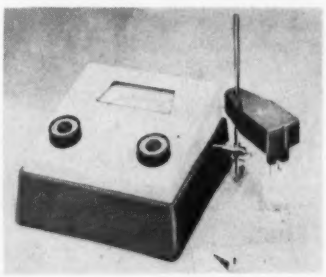
Circle 314 on Reader Service Card

Quick-Change Storage Racks

In new live-storage system, racks incorporate railed lanes that are readily changed in width to accommodate different size cartons and cases. Thus there's no need to re-structure racks for new boxes.

Of "hat section" design, special rails require no bothersome fastenings, hence re-settings are made in a jiffy. Maker says racks are ideal for order picking, save space, and serve to eliminate errors arising with less-flexible storage. — *Alvey-Ferguson Co., Cincinnati 9, Ohio.*

Circle 315 on Reader Service Card



Wide-Range pH Meter

This Metrion pH meter is described as a less-costly instrument capable of high precision in an extended range. Duplex scales cover 0 to 10.0 pH and 4.0 to 14.0 pH.

Accepting all modern pH electrodes, it offers a system that suitably adapts to titrations and a wide range of sample volumes.—*Coleman Instruments, 42 Madison St., Maywood, Ill.*

Circle 316 on Reader Service Card

Versatile Transmission

Heavy duty operations, involving variable speeds and instant reversing are readily handled with a new 1½-hp. hydraulic transmission.

Operating from 0 to 350 rpm., unit's control not only affords instant reversing but also has a neutral position, plus integral torque multiplier for high-torsion use.

"Package" includes 6-qt. oil reservoir and electric motor in either single or 3-phase 60 cycle, with 1-in. shaft dia. —*Roberts Mfg. Co., 849 W. Grand Ave., Chicago 22.*

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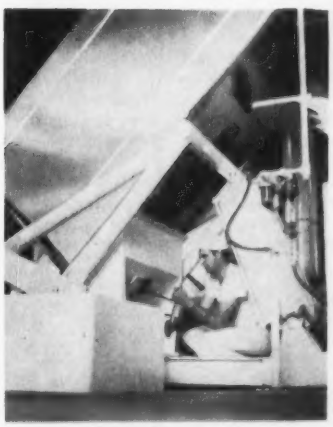


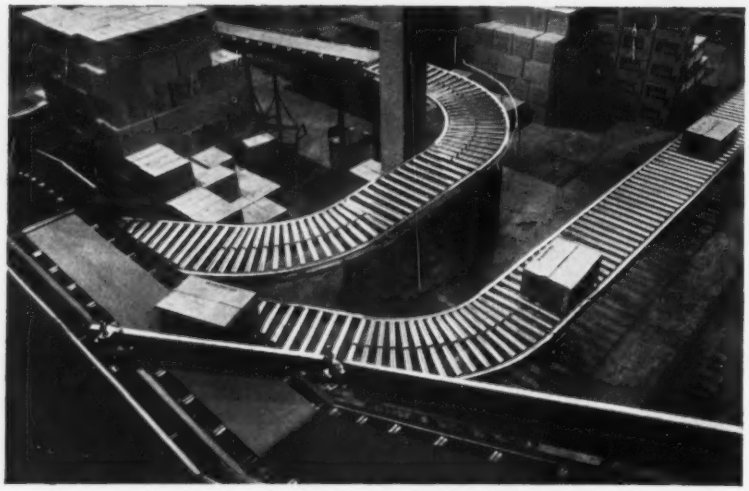
Low-Headroom Tote Tilt

This pullover-type discharge mechanism for Tote Bins is especially designed for use in low-headroom areas. Unit is available for both screw and gravity discharge.

Manufacturer says equipment has added advantage of permitting a gasketed duct-tight seal between Tote hopper and surge hopper into which it feeds.—*Tote System, Inc., Beatrice, Neb.*

Circle 318 on Reader Service Card

Ask Standard how to cut costs with conveyors



Order picking is expedited and simplified by this Standard system of roller and belt conveyors in large warehouse.

Roller and belt conveyors ease warehouse traffic jams

FAST flow of goods and simplified labor add up to more profitable warehouse operations.

Standard offers a wide variety of gravity and powered, permanent and portable conveyors — that can help you establish smooth, more profitable warehousing.

Spend a few moments with a Standard engineer. He'll show you how inexpensive Standard conveyors give you maximum flexibility at minimum cost. He'll show you, too, how Standard conveyors provide the many advantages of a custom-designed system at low cost. For the name of your nearby Standard engineer write STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minn. Sales and Service in Principal Cities.

(LEFT) Belt-booster in a gravity roller conveyor "order picking" line. (RIGHT) Lift or lower floor-to-floor with an INCLINEBELT. Available in a wide range of heights and belt widths.

Write for Bulletin 309. Address Dept. D-2, or contact the Standard engineer listed in your classified phone book.

Standard OVER 50 years of conveyor experience

GRAVITY & POWER CONVEYORS

Equipment & Supplies

For Multi Chromatograms

This multiple-strip chromatography equipment can run up to six different solvent systems simultaneously. Suitable for desktop use, unit can produce 1-dimensional ascending or descending paper-strip chromatograms within 1-2 hr.

Supplied are 6 glass tubes (15x2 in.) with ¼, 1, or 1½-in.-wide paper strips. Minimum solvent volumes give high ratio of solvent to air space for constant R_f values.

Total space required is 11¾x5¼ in. — *Microchemical Specialties Co., 1825 Eastshore Highway, Berkeley 10, Calif.*

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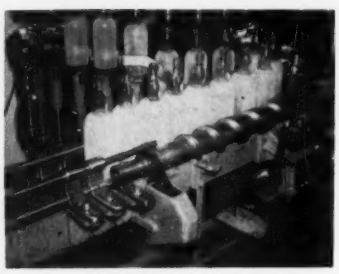


Precision-Cut Infeed Screws

Advanced-type infeed timing screws of constant-speed, accelerated-pitch design are now available for use on various models of filling equipment.

A patented cutter is employed to produce exact pitch and correct pocket (straight side or contour) as required on buyer's unit.

Screws can be made to almost any dimension and from a choice of many different materials, including plastics as well as metals (plated and unplated). Photo shows feed screw operating on bottle filler.—*Horix Mfg. Co., Pittsburgh 4.*

Circle 320 on Reader Service Card

PROTEIN 29% HIGHER

Exclusive Sales Plus
for High-Protein Health Appeal

Griffith's New
Sodium Proteinates
ISOPRO (pH 5.3-5.5)
PROMAX (pH 6.7-7.0)

PROTEINATES FOR SPECIALTY BREADS • BREADINGS • BABY FOODS
SPAGHETTI • DOG FOOD • BREAKFAST CEREAL • USE PERMITTED
IN UNSPECIFIED LOAVES IN FEDERALLY INSPECTED MEAT PLANTS

Griffith drew upon the spice flavor skills of its corps of chemists to solve the research problem of a decade! By patented process of wet-milling soy flour, Griffith *removes that soybean flavor!* Produces economical and stable sodium proteinates that contain 29% more protein and 33% more lysine than soy flour! Learn all the advantages of using either ISOPRO or PROMAX in your products for high-protein health appeal. Write your name and the request, "Send facts on ISO-PRO and PROMAX", on your letterhead and mail it today.

U.S. Patent No. 2,881,076

Griffith

THE GRIFFITH LABORATORIES, INC.

CHICAGO 9, 1415 W. 37th St. • UNION, N. J., 855 Rahway Ave. • LOS ANGELES 58, 4900 Gifford Ave.

Another in a series of Hoerner Corrugated Shipping Container Experts

THIS IS THE HOERNER SPECIALIST FOR PACKAGING BOTTLED THINGS

Perfume, prescriptions, pop or ships—if it's bottled this Hoerner specialist has crafted an economical corrugated container that ships it safely. If you're pouring out profit with inefficient packaging, call on a Hoerner specialist for help in bottling up shipping damage at pint-sized costs.

HOERNER BOXES, INC.

Corrugated Specialists for Mid-America

GENERAL OFFICES: 600 Morgan Street, Keokuk, Iowa • PLANTS: Fort Smith and Little Rock, Arkansas; Des Moines, Keokuk and Ottumwa, Iowa; Sand Springs, Oklahoma; Minneapolis, Minnesota; Tupelo, Mississippi; Springfield, Missouri; Fort Worth, Texas; Sioux Falls, South Dakota • AFFILIATE: Cajas y Empaques Impermeables, S.A. Mexico City D.F., Mexico

Equipment & Supplies

Top-Visibility Walkie Truck

Low-silhouette design gives operator increased working visibility on this new heavy duty walkie fork-lift.

Powered by a 24 v. battery and designed with 24 v. components, counterbalanced "Jackstacker" also allows operator to ride on battery compartment.—*Lewis-Shepard Products, 125 Walnut St., Watertown 72, Mass.*

Circle 321 on Reader Service Card

Speeds Order Picking

Fast "one hand" order picking is reported using this Versarack live-storage rack.

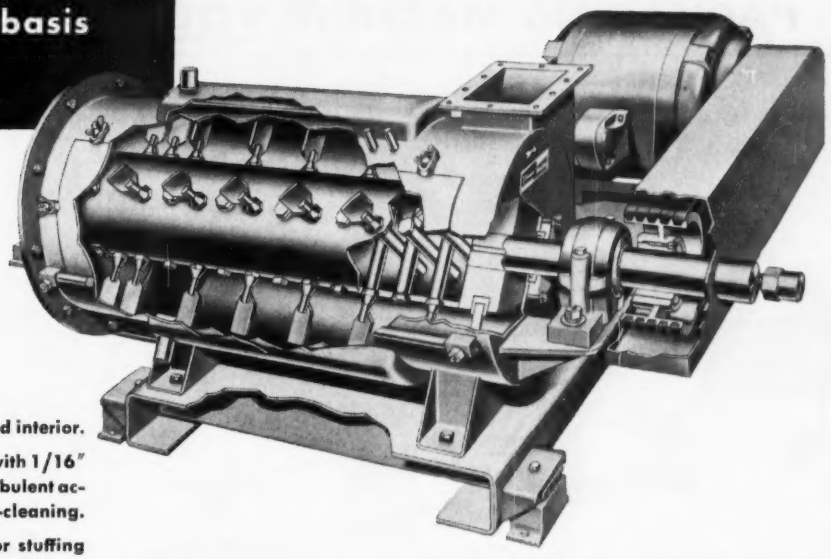
Finger tip pressure releases carton stored on racks fitted with ball-bearing wheel stops. Then pressure of preceding cartons ejects box into pickers' hand. Addition of transverse conveyor in the aisle in front of rack allows picker to drop carton with one hand for carry-away.

Additional benefits cited are reduced floor space, easier inventory control, simpler maintenance, and improved merchandise protection.—*M-H Standard Corp., 517 Communipaw Ave., Jersey City 4, N. J.*

Circle 322 on Reader Service Card

There's one sure way to get intimate mixing of dry and semi-dry material on a continuous basis

Strong Scott TURBULIZER®



EXCLUSIVE TURBULIZER FEATURES

- Heavy steel shell with machined interior.
- Paddles revolve at high speed with 1/16" clearance to shell, creating a turbulent action that makes Turbulizer self-cleaning.
- Choice of lip type, air purge or stuffing box seals. All are of split construction for quick disassembly. (Lip type seal shown.)
- Hinged door is machined as an integral part of the shell giving a perfectly smooth interior surface.
- May be equipped with jacket up to 150 PSI for heat transfer medium.
- Hollow rotor shaft for heat transfer medium gives added temperature control.
- Inlet nozzles available for adding liquids.
- Quick acting heavy lug type catches—no nuts or bolts to remove.
- Tangential inlet and discharge prevent material hang-up.
- Heavy duty outboard bearings.
- Rotating joints for easy connection to heat transfer medium source.

The Turbulizer solves many dispersion problems in the chemical and food industries. Adjustable-pitch paddles, revolving at high speed, result in the combined action of turbulence, shear and impact providing intense dispersion. These actions can be varied to obtain desired results on a specific material.

A completely smooth inner surface with 1/16" clearance paddles, assures thorough mixing, eliminates material hang-up, leaves no dead pockets of unmixed material and provides a self-cleaning operation.

In addition to the numerous features shown here, advantages of the Turbulizer include better product uniformity, increased production, plus lower labor, installation and up-keep costs.

Write for complete details...

Please send information on the Turbulizer

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

FE-260

The Strong Scott Mfg. Co.

451 TAFT STREET NE • MINNEAPOLIS 13, MINNESOTA

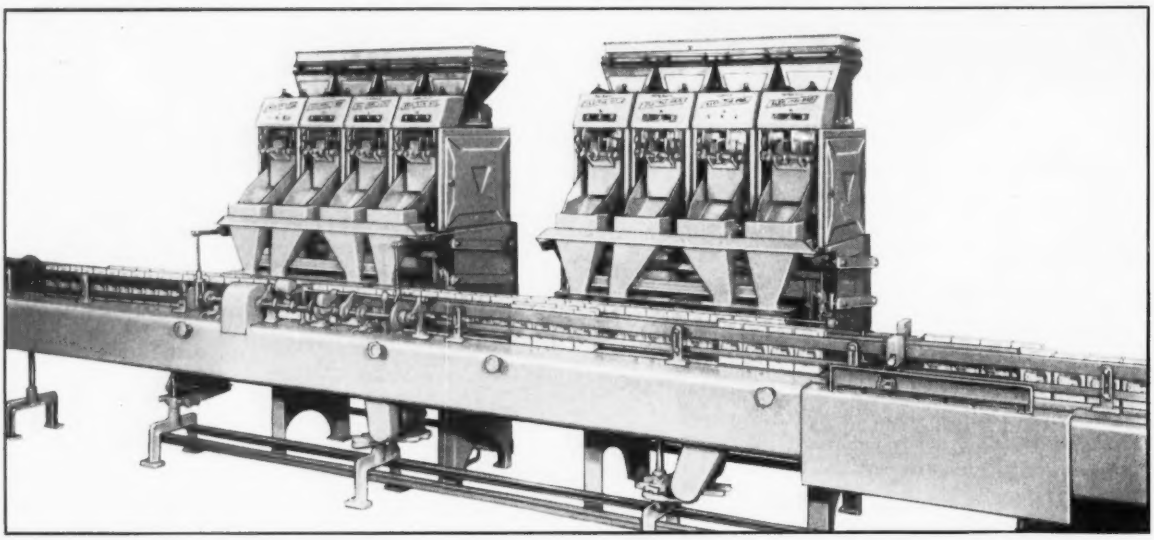
EQUIPMENT DESIGNED FOR BETTER PROCESSING

What Does It Take To Build Automatic Packaging Machinery?

Obviously, the engineering development of any fully automatic packaging installation is a complex matter. Any good engineer can design a custom machine that will do the job one way or another. However, the problems presented by actual production conditions need the simplest, most economical solution. The machine that best solves the problems is always a combination of proven automatic packaging techniques and experience. In other words, a fitting of perfected methods into your plant operations.

That "fitting" is often the only difference between uneducated iron, and an automatic packaging system that really pays off.

HOW DO YOU KNOW *WHOSE* AUTOMATIC PACKAGING MACHINE YOU SHOULD HAVE?



Regardless of what form the machine itself takes, the success of its operation in *your* plant depends on two basic factors—the talent and experience of the machine manufacturer to fit your requirements . . . and the proven automatic units that he combines into a machine.

First, let's consider the units or "proven concepts" he has developed in the years of his experience. And, for the sake of example, take the machine shown above that packages a nationally known brand of baby cereal:

The machine must be capable of continuous high speed operation under the toughest plant conditions. It must operate with the least possible attention.

This Triangle Automatic Machine Delivers 120 Packages Per Minute And Is Capable Of More . . . Truly Automatic—Week After Week, Month After Month And Year After Year.

The machine must be accurate. It must deliver packages filled to as precisely the right amount as possible.

This Triangle Automatic Machine Uses Elec-Tri-Pack Net Weighing Scales That Are Sensitive To 1/32 Oz. Or A Single Piece.

Triangle's 37 years of automatic packaging experience is the other factor in the success of this baby cereal packaging machine.

It has given Triangle the ability to provide any type of feed from floor to overhead for handling dog biscuits or powdered dry milk. Furthermore, the Triangle machines are properly synchronized with other plant processing operations.

Triangle *is* a specialist in the business of fully automatic packaging machines. Many high volume packagers of a wide variety of products (names on request) depend on Triangle equipment.

The next time you're considering machinery of this type, ask the location of other Triangle installations, and see the facts for yourself.

37 YEARS

.....YOU REALLY SAVE WITH.....

TRIANGLE
PACKAGE MACHINERY COMPANY

6637 W. Diversey • Chicago 35, Illinois
Telephone TUxedo 9-0200

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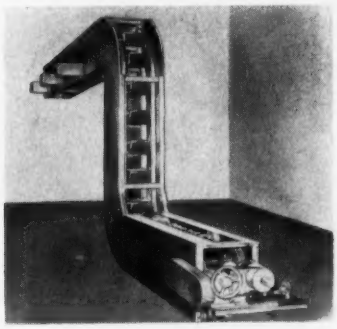

Control for Multi-Bin Service

Automatic bucket control now permits one Econ-O-Lift elevator conveyor to service several different bins or hoppers.

When materials in a bin fall under a predetermined level, a single solenoid activates a nylon-covered cam to cause buckets reaching this point to dump. When high level is reached, solenoid switches cam out of position, and buckets will not drop at this bin.

Material level indicator, which controls action of the solenoid and cam, is directly connected to bin.—*Econ-O-Veyer Corp., 224 Glen Cove Ave., Glen Cove, N. Y.*

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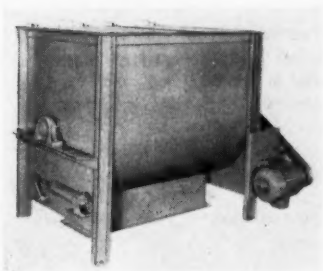

Economical Ribbon Blender

Up to 200 cu. ft. of blend is produced by this new ribbon-type unit that features wide-capacity range, controlled agitation, maintenance-free operation, and low power requirements.

Heavy duty tub has externally adjusted packing glands. Agitator is a reversing double spiral ribbon supported on outboard bearings.

Both standard or sanitary constructions are available with internal spray lines for liquids. Other options include countershaft and chain drive combination, or torque arm and V-belt drive.—*Munson Mill Machinery Co., 1000 Seward Ave., Utica, N. Y.*

Circle 324 on Reader Service Card

WHERE CAN A COMPANY OBTAIN INFORMATION ON THE MOST MODERN METHODS OF CONTINUOUS DRYING?

One company recently placed orders for nearly $3,000,000 worth of Surface continuous dryers. More and more chemical and food plants are using the modern services of Surface Combustion engineers.

Purchasers are demanding dryers custom designed to fit the particular problem rather than "Hand-me-downs" to complete the plant automation.

Surface Combustion engineers have many advantages to offer: Kathabar Humidity Conditioning Units; Air heaters instead of individual burners; Laboratory Facilities for testing customers' products; large organization of engineers experienced in mechanical and structural design.

GET FACTS

SURFACE COMBUSTION
A division of Midland Ross Corporation
2382 Dorr Street, Toledo 1, Ohio
Send facts on Kathabar systems for following application:

.....

name & title .....
company .....
street .....
city ..... *zone* ..... *state* .....

59-4

In Europe: NEDAIRCO, The Hague. In Japan: CHUGAIRO, Osaka.

Jefferson Chemical
is your best source for
high purity

U. S. P. PROPYLENE GLYCOL

Most Versatile Polyol
for Use in Foods, Flavors
and Extracts

U. S. PHARMACOPOEIA Grade Propylene Glycol has low toxicity and excellent solvent, hygroscopic and preservative properties which make it preferred in a great variety of food processes. Food flavor, color or emulsion solvent; flavor extractor; humectant in packaged food products . . . these are a few of the proved applications for U.S.P. Propylene Glycol.

For helpful technical service on any application, or prompt delivery-price information, write to Jefferson Chemical Company, Inc., 1121 Walker Ave., P. O. Box 303, Houston 1, Texas.

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Ethylene and Propylene Oxides, Glycols, Dichlorides • Ethanolamines
Morpholine • Piperazine • Polyethylene Glycols • Nonyl Phenol
SURFONIC® Surface-Active Agents • Ethylene and Propylene Carbonates
Caustic Potash • Caustic Soda • Soda Ash • Sodium Bicarbonate

Essential Chemicals From Hydrocarbon Sources

185

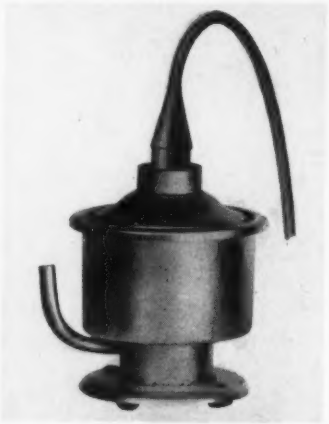
Equipment & Supplies

Latest Upright Compressor

Completely new, this vertical, single-stage compressor is latest in line of quality heavy duty air, gas boosting, and oil-free units.

Listed as the WG-9H, it has piston displacements from 633 to 1,630 cfm. with maximum pressures to 125 psi. and hp. ratings to 150.—*Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22.*

Circle 325 on Reader Service Card



New Submergible Pump

Small long-life Model 300 brass pump operates efficiently while either partially or entirely submerged, as in citrus juices or other food liquids, or in milk coolers, ice-making machines, or similar equipment.

Completely sealed units include molded Neoprene cord sets and leakproof terminal blocks. There are three models offering capacities ranging from 200 to 514 gph.—*Thomas Beckett & Co., Inc., Dallas, Tex.*

Circle 326 on Reader Service Card

Atlas

ENGINEERED
FLOORS
END COSTLY
MAINTENANCE

. . . provide lasting beauty!

Atlas Food Plant Floors combine lasting beauty and long service with a construction that permanently ends costly maintenance. Since these floors are completely corrosion-resistant thay are not attacked by any food acids or harsh cleaning agents. Patching is never required.

Individually engineered to your exact specifications, they are not affected by expansion, contraction nor thermal shock. In addition, Atlas floors retain their attractiveness even in the face of severe impact or continuous truck traffic.

Let Atlas show you how to permanently solve your food floor problems.

Write for your copy of Bulletin 3-2.

ATLAS MINERAL
PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

MOVE IT

in DI-CEL cartons

A wide variety of bakery items—cakes, cookies, biscuits, sweet rolls—reach the retail store in undamaged condition when packed in CCA's unique new carton. Its name: DI-CEL®. Because of its cushioning cell structure DI-CEL prevents rolling (and breaking) of baked goods in transit. Results: fewer markdowns because of spoilage, greater acceptance of your product by retailers and customers alike. To **pack it—move it—sell it** is the business of CCA packaging.

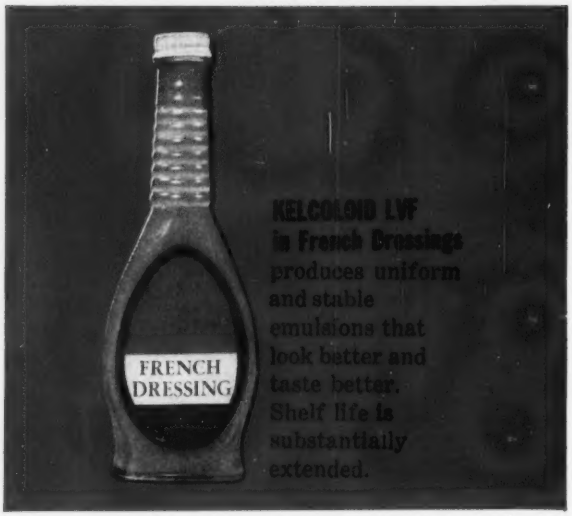
CONTAINER CORPORATION OF AMERICA

CCA

Chicago 3...and all key marketing areas. Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products

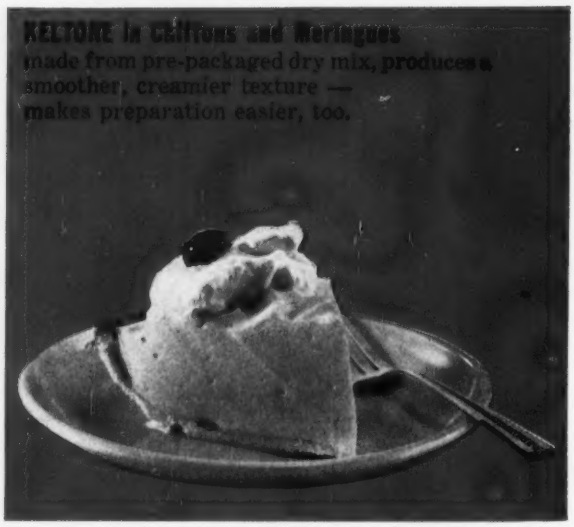
Amazing the way Kelco Algin makes your products better

KELCO-GEL HV in Gels
makes high quality, sparkling clear, tender non-melting dessert and salad gels that have a fast, clean mold release.



KELCOLOID LVF in French Dressings
produces uniform and stable emulsions that look better and taste better. Shelf life is substantially extended.

KELCO-GEL LV in Dietetic Puddings
gives smooth texture, firm body for added taste and eye appeal.

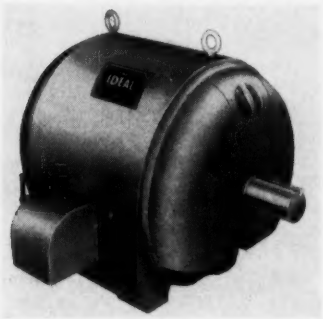


KELTONE in Chiffons and Meringues
made from pre-packaged dry mix, produces a smoother, creamier texture — makes preparation easier, too.

—and enables you to develop new, improved products, too!

KELCOLOID LVF® KELCO-GEL HV® KELCO-GEL LV® KELTONE® PRODUCTS OF KELCO COMPANY

120 Broadway, New York 5, N. Y • 20 N. Wacker Drive, Chicago 6, Illinois • 530 West Sixth Street, Los Angeles 14, Calif. • Cable Address: Kelcoalgin



Advanced Induction Motors

New design features high-speed, squirrel cage induction motors now available in 100-5,000 hp. models turning up 514-3,600 rpm.

One piece, wrap-around steel plate cover runs full length of frame, providing drip-proof protection and increased rigidity. Double-end ventilation system gives maximum cooling.

Split-type bracket, housing special lubricated bearing, permits bearing replacement without uncoupling the motor or disconnecting leads.

Motors are available with silicone rubber insulation as well as class A, B, and H types.—*Ideal Electric & Mfg. Co., Mansfield, Ohio.*

Circle 327 on Reader Service Card

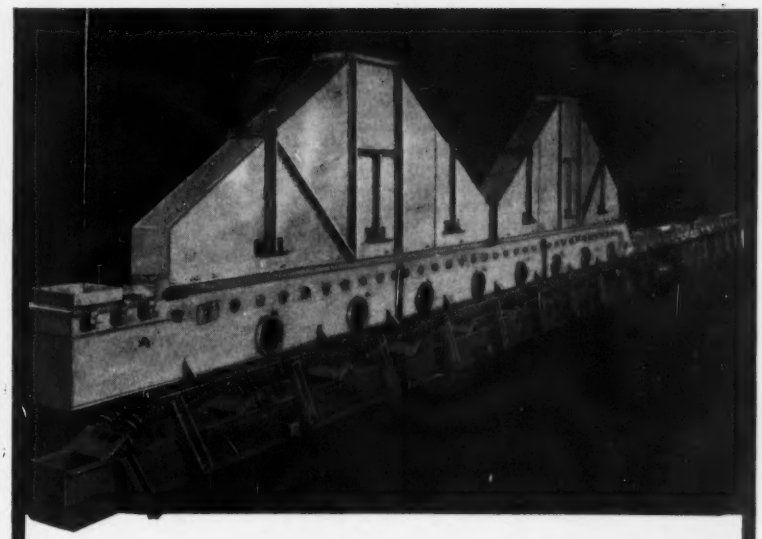
INGREDIENTS

New Natural Coloring Agent—a 20% concentrate of carotenes—is announced. Also available are blends having added vitamins A, D_2, or D_3. Cited is product's greater solubility in oils and increased dispersibility in aqueous media.—*Nopco Chem. Co., 60 Park Pl., Newark, N. J.* (328)

NEW SUPPLIES

Sanitary Spray Lube, called Lubri-Film, has been specially formulated for heavy duty applications in food industry. A non-contaminating plastic-type product, it's supplied in 6 and 16-oz. aerosol cans.—*Haynes Mfg. Co., Cleveland* (329)

Special Steel-Plate Floorings incorporate acid-alkali-proof resins plus membrane that guards against any seepage into base slab. Diamond treading gives positive footing while permitting easy sliding of cans or cases. Shipping docks, storage and cooler rooms and wet process runs are specific application areas in ice



DRY! SCREEN! CONVEY!

ONE Carrier Conveyor Does It All!

A well-known chemical processor needed a unit that would *dry* and *convey* 5/16" carbonaceous particles at a rate of 2 TPH (on a limited floor area).

This efficient Carrier Natural-Frequency Dryerveyor (60′ long, 12" wide) *filled the bill!* It reduced conveying, drying and maintenance costs, and Carrier pre-assembly made installation easy.

This custom engineered Carrier Dryerveyor has an easy-to-adjust dual drive that permits two different conveying speeds—one for drying (2 TPH) and one for standard conveying (15 TPH).

The moist particles are quickly dried by the 350°F. air which passes through them as they vibrate along the screen deck. The drying section is designed to expand or contract without stressing the structural parts. *Particle moisture is reduced from 14% to .5%* and fines are removed before the material enters the 30′ conveying section.

For more information, write: Carrier Conveyor Corporation, 216 North Jackson St., Louisville, Ky.

CARRIER
~~NATURAL-FREQUENCY~~
VIBRATING EQUIPMENT
Engineering Specialists in Vibrating Equipment

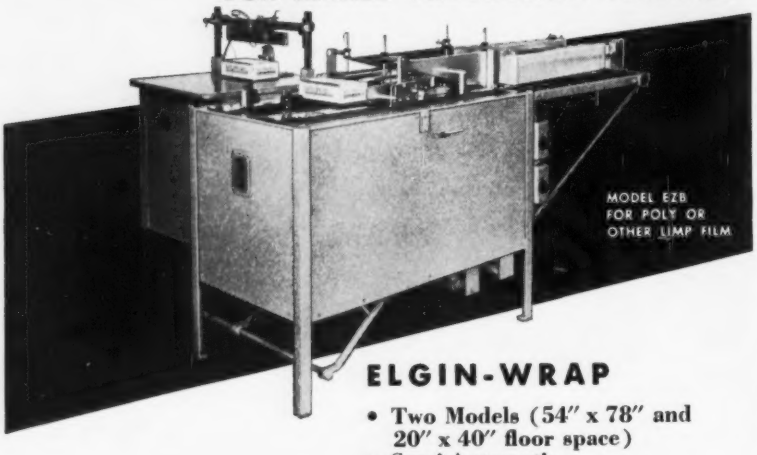
CONVEY ● FEED
DEWATER ● SCREEN
COOL ● AGGLOMERATE
DRY ● SCALP ● COAT
DISTRIBUTE ● ELEVATE
● FLATTEN BAGS

CIRCLE 129 ON READER SERVICE CARD

Elgin
EARNS ITS WAY

NOW! economical wrapping

FOR LIMITED PRODUCTION DEMANDS



ELGIN-WRAP

- **Two Models (54" x 78" and 20" x 40" floor space)**
- **Semi-Automatic**
- **Fully, Simply Adjustable**
- **Handles Variety of Films, Wax papers or foil • Motor Driven**
- **Convenient Foot Treadle Control • Includes Working Table**

PMMI

Write today for complete specifications and low prices

ELGIN MANUFACTURING COMPANY

200 BROOK STREET, ELGIN 5, ILLINOIS

SPECIALISTS IN PRECISION PACKAGING EQUIPMENT FOR MORE THAN 60 YEARS

CIRCLE 229 ON READER SERVICE CARD

add sales punch to your foods with **PRO-80** *protein*

The sales punching-est words in food merchandising these days are "protein enriched." With General Mills Pro-80 Vital Gluten (80% wheat protein m.f.b.) you can raise the protein content of your foods to any level desired. Economically. Easily. Pro-80 provides these processing benefits:

★ *Hydration agent* ★ *Oil and fat absorber*
★ *Adhesive and cohesive agent*
★ *Dough former* ★ *Strengthening agent*

You should get all the facts about Pro-80 right now while interest in protein enrichment is still climbing. For more specific information covering your food product write:

SPECIAL COMMODITIES DIVISION
Minneapolis 26, Minn.

General Mills

Equipment & Supplies

cream, meat, canning, bottling, and other food plants.—*Chemsteel Construction Co., Inc., 5428 Walnut St., Pittsburgh 32.* (330)

Handy Repair Kit, called Old Pro, offers materials for many mending and patching jobs formerly requiring brazing, riveting, welding, or soldering. Included are 1 qt. each of paste-type and liquid-plastic resins, glass-fiber cloth, and necessary mixing tools and brushes. When hardener (catalyst) is added, both resins cure in minutes to super-tough mass that's highly adhesive yet relatively flexible. —*Taylor & Art, Inc., Oakland 6, Calif.* (331)

Pipe Covering of Uni-Crest expanded polystyrene is announced. Offered in 1, 1½, and 2-in. sizes, the sleeves stop heat gain, prevent condensation and dripping.—*United Cork Co's., Central Ave., Kearny, N. J.* (332)

New Brewers-Distillers Hose for conducting or siphoning beverages is made of purest rubber and ingredients for minimum absorption, maximum strength and flexibility. Smooth-flow tubing prevents frothing and collection of bacteria.—*Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.* (333)

BRIEFS

Straddle-Type Truck newly offered is medium-capacity model for handling loads to 20,000 lb. Designated the M200E, it features shorter turning radius and higher road speed (to 52 mph.) for fast, profitable transport of materials.—*Hyster Co., P.O. Box 847, Danville, Ill.* (334)

New Electric Tester is handy pencil-like device for quick checks on current performance of outlets, switches, appliances, etc. When contacted unit is 'live', tester lights up. Price $1. —*The Hahn Co., 2311 Fox Hills Dr., Los Angeles 64.* (335)

Odor-Controlling Air Sanitizer, Turgasept, offers plus value as bactericide. Concentrate is dissolved in water to form effective washing solution. It's also available in 16-oz. aerosols. In action, molecules of agent combine with obnoxious particles to form odorless compounds.—*Turgasept Co., 505 5th Ave., N.Y.C. 17.* (336)

SERIES 60—normal needs, pressures to 400 psi, 6 sizes. **SERIES 120**—normal needs, pressures to 600 psi, 6 sizes. **SERIES 40**—for extra heavy loads, 5 sizes. **NO. 30**—for extra light loads (½" only). **INTEGRAL STRAINER**—highest pressures and marine use, 6 sizes.

NEW NO. 30 IS A LIGHT LOAD SPECIALIST

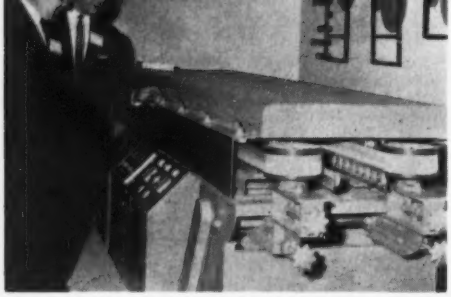
When the condensate load in your steam lines is *extra light*—this new Yarway ½" No. 30 Steam Trap is *exactly right.*

Specify it. You'll experience new *economy of operation* with the *tighter shut-off.* Operation is *quieter* due to lever action. *Maintenance is less*—because of the replaceable valve-seat assembly, only one moving part and stainless steel construction. Enjoy these special features plus all the regular advantages of famous Yarway Impulse Traps such as *quick heating, even temperatures, small size, good for all pressures, non-freezing.*

Over 1,250,000 Yarway Impulse Traps already sold; buy yours from one of 270 local Industrial Distributors.

YARNALL-WARING COMPANY
100 Mermaid Ave., Philadelphia 18, Pa.

YARWAY *impulse® steam traps*



DIELECTRIC CARTON SEALER employs high-frequency waves to activate cold polyvinyl adhesive applied to surfaces of waxed containers. Eliminates overwrapping. Special carton has partially cut tear-line for easy opening.—Container Corp. of America, Chicago. (300)

WIENER PACKAGER simplifies operations. It's intake belt feeds 9 wieners to double-dial scale that gages overweight fractions. Included are 5-compartment tray for make-weight wieners and discharge conveyor.—The Exact Weight Scale Co., Columbus, Ohio. (301)

2 New Packaging Units

Latest Machines for Processing Line . . .

. . . draw eyes at American Meat Institute show in Chicago. Included are new units for packaging, weighing, emulsifying, comminuting, stuffing

2 Weighers

HAM-PUMPING SCALE, equipped with recorder-totalizer or weight gage, works automatically. Pickle is supplied under normal pumping pressure. Recessed scale permits easy feed and discharge of hams during operation.—Hagan Chemicals & Controls, Inc., Pittsburgh. (302)

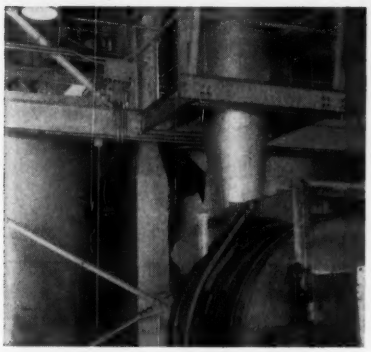
BALANCE & RECORDER unit (pneumatic) has built-in "loss-of-weight" multiplier. It's designed for continuous scaling of "tree" of meats during smoking. Ratio relay adjusts for desired percentage product-weight loss in smokehouse.—Hagan Chemicals & Controls, Inc, Pittsburgh. (303)

Emulsifier

RAIL-MOUNTED EMULSIFIER (A), fitted with hopper, rotary knives, and pump, handles 10,000 lb. of emulsion per hr. Continuous filler (B) comprises double auger pump and variable drive to feed up to 18,000 lb. of emulsion to 1-6 stuffing horns. Adjustable remotely controlled tachometer is a feature.—John E. Smith's Sons Co., Buffalo, N. Y. (304)

Problem:

To reduce cost of blending 200 dry powder formulas from 52 raw materials



Solution:

SPROUT-WALDRON

PNEUMATIC SYSTEM

Pushbutton blending of over 200 different dry powder formulas, from 52 raw materials at Dearborn Chemical Company is credited with a 1300% increase in manpower efficiency. 98,000,000 lbs. a year of diverse formulas for water conditioning and corrosion control can now be turned out by sixteen operating and maintenence personnel at the Dearborn plant. This rate of 6,125,000 lbs. per man per year is contrasted with the rate of 438,500 lbs. per man per year at their old plant.

Credit for this tremendous increase in efficiency goes to the speed and automation of the Sprout-Waldron pneumatic handling system. This air transfer system handles the dry chemicals at rates to 80,000 lbs. per hour over a 25 ft. horizontal run and a 69 ft. lift.

Sprout-Waldron positive and negative pressure systems are helping industry cut costs and speed handling. Further specific information can be found in Bulletins 118 and 208. Copies available on request.

CW/106

SW **SPROUT-WALDRON**

Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

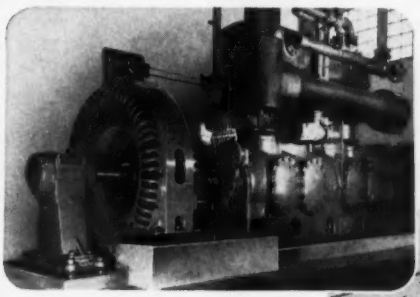
CIRCLE 230 ON READER SERVICE CARD

No name among American makers of cooling equipment stands higher or has endured longer than that of Frick.

Back of the Frick trademark are 107 years of experience in engineering, 78 in refrigeration and ice making, and 55 in air conditioning. You get the value of this priceless experience when you invest in dependable Frick equipment.

Write, wire or phone now for catalogs and estimates.

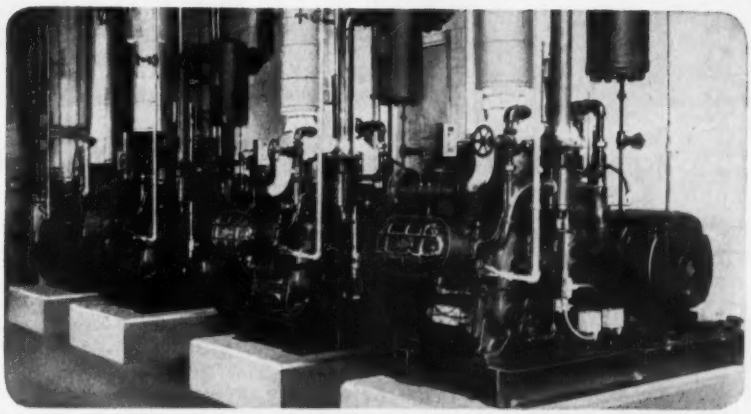
FRICK COMPANY,
Waynesboro, Penna.



ABOVE—Frick heavy-duty compressors are the standard of the world for industrial work. Ask for Bulletin 112.

RIGHT—These Frick evaporative condensers are saving $1,000 per month. See Bulletin 235.

BELOW—Frick "Eclipse" compressors have 2, 3, 4, 6 or 9 cylinders, offer speeds up to 1200 r.p.m. See Bulletin 100.



DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA., U. S. A.

CIRCLE 133 ON READER SERVICE CARD

Latest Machines for Processing Line

gets there in boxes of *M/R*® corrugated board

Buyers, packers and growers agree: Nothing else gets wet-cooled produce to market in fresher, better condition than boxes of M/R corrugated board. These sturdy, lightweight shipping containers cushion rough handling, insulate more thoroughly, keep fresh fruit and vegetables cooler longer.

They save money on storage, packing, handling and shipping. Get the facts about M/R corrugated board boxes for shipping produce. See Hinde & Dauch—you stand to save important money.

Hinde & Dauch Division

West Virginia Pulp and Paper

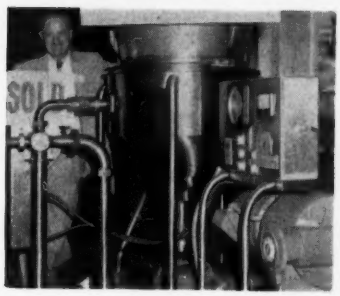
Hinde & Dauch Division, West Virginia Pulp and Paper Company, Sandusky, Ohio • 17 Plants • 42 Sales Offices

Latest Machines for Processing Line

Comminutor

FRESH-MEAT COMMINUTOR is high-capacity, centrifugal-force unit. It extrudes and finely cuts product without crushing or smearing. Bones and tendons are separated from meat, which retains color and bloom. Lean and fat are uniformly cut with self-sharpening knives.—A. W. Hughes, Bensenville, Ill. (305)

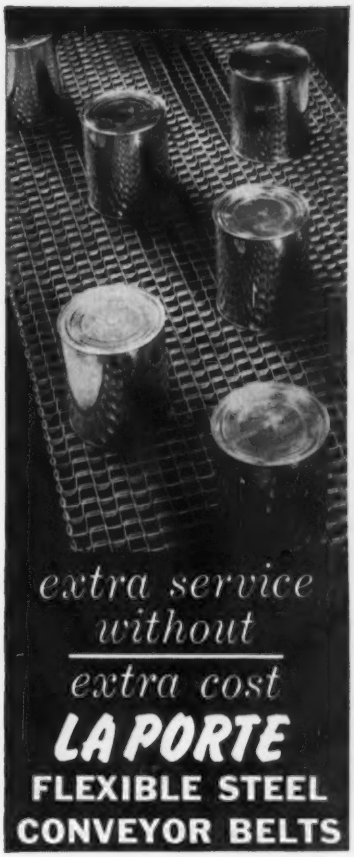
Stuffer, Gas Injector, Tile-Like Coat



CONTINUOUS STUFFER has timer that's preset for uniform proportioning of product into 50-ft. casings. Unit then diverts mix long enough for operator to feed casing onto stuffing horn. Air-operated, equipment has vari-speed drive to handle up to 400 lb./min.—St. John & Co., Chicago. (306)

SYSTEM THAT INJECTS CO_2 is thermostatically controlled through electrically actuated solenoid and air-operated valve to chill meat in mixer and improve its texture and bloom. Similar installations can be used for cutters, grinders, sausage linkers.—General Dynamics Corp., Chicago. (307)

3-PLY SURFACING gives a tile quality to cement or cinder-block walls. Consists of smoothing, base, and finish plies, put on by brush and roller. Maker says coating resists contaminating agents, and produces strong moisture barrier. Economy is cited.—Master Mechanics Co., Cleveland. (308)



IN every process, La Porte out-performs and outlasts other types of conveyor belting. It firmly grips the friction drum or La Porte Sprocket to eliminate *creeping, weaving* and *jumping.* It has a perfectly flat surface for handling all types of containers, empty or filled. Open mesh feature provides for circulation of air, heat, cold or moisture around products in process. Also facilitates cleaning or sterilizing with steam or scalding water while in motion. Highly resistant to heat, cold, oils, brine. You get more for your money in a La Porte.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

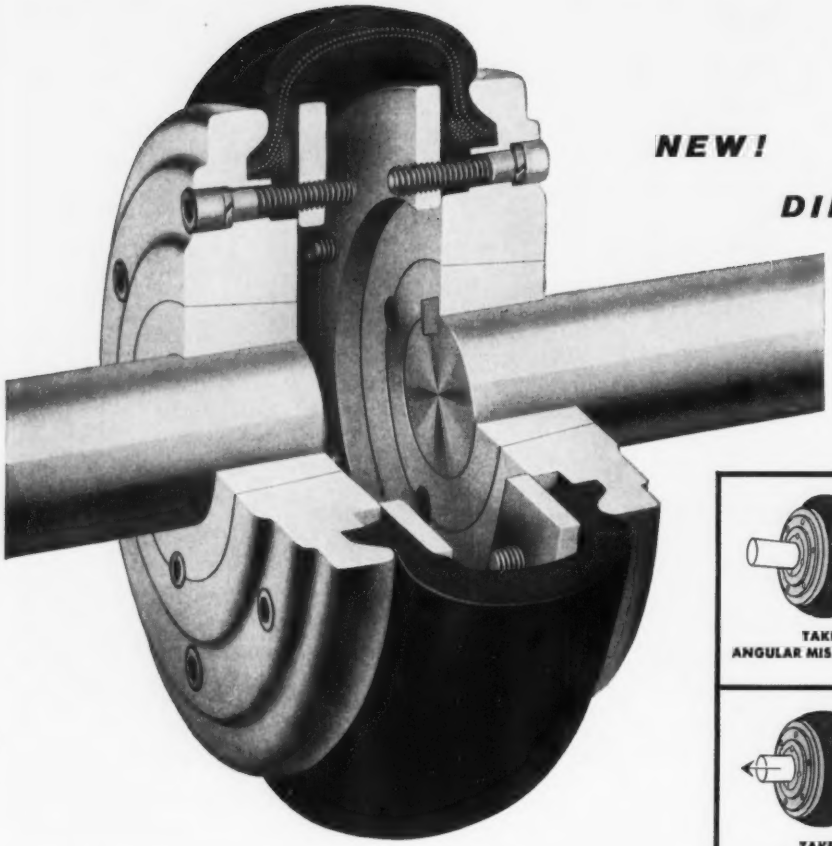
LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

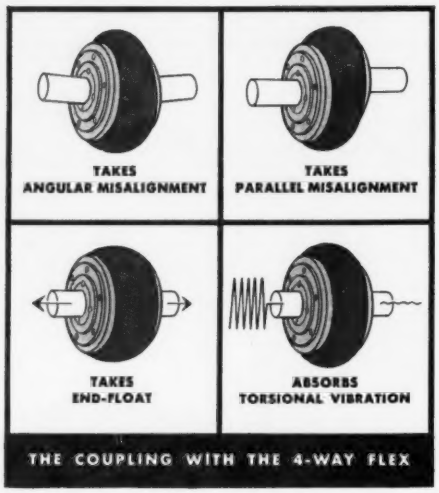
ADDRESS_____

CITY_____ STATE_____



NEW!

DIFFERENT!



DODGE

Para•flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 2000 hp at 1080 rpm. Call your distributor for a coupling to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 2800 Union, Mishawaka, Ind.

DODGE
of Mishawaka, Ind.

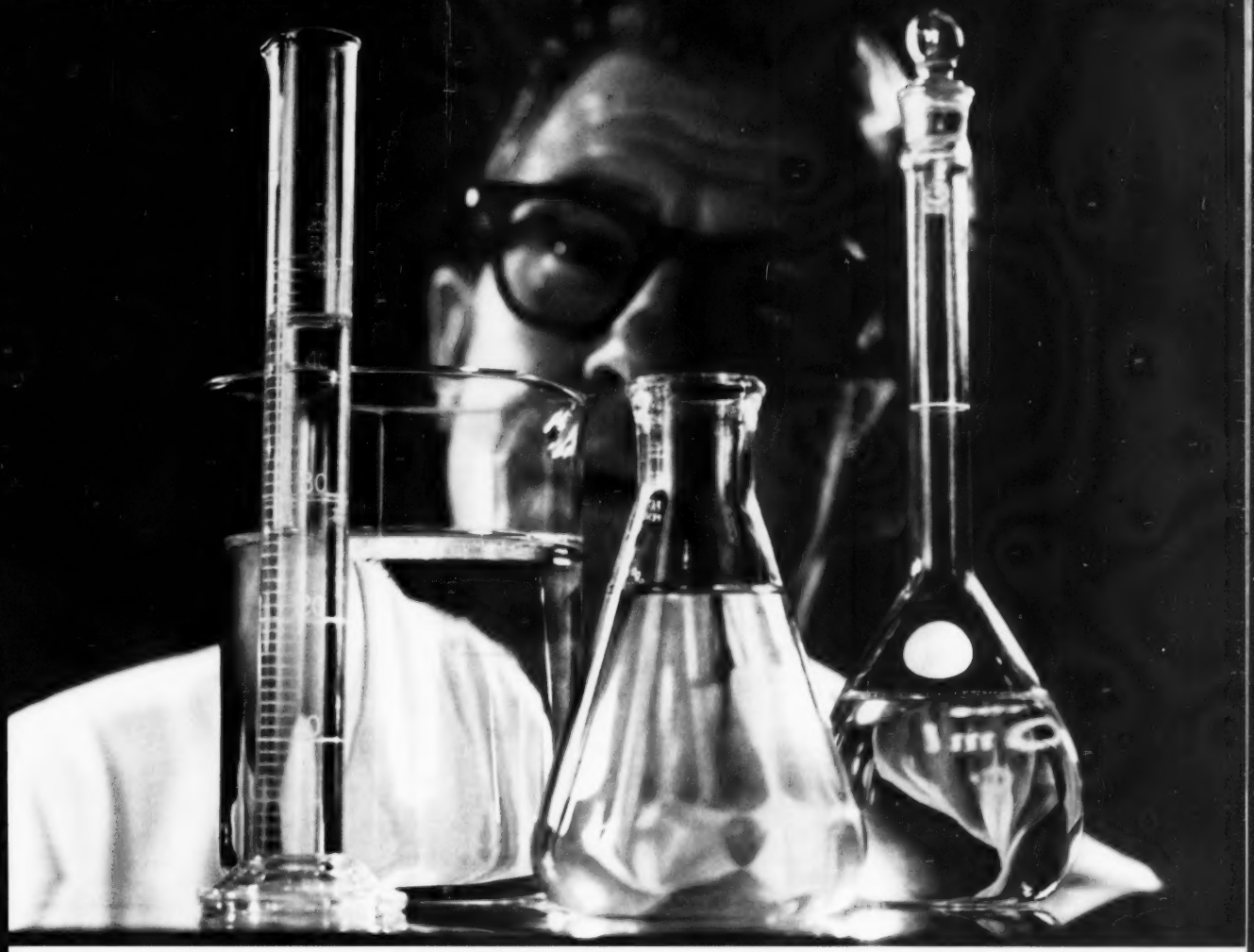
CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

136 CIRCLE 136 ON READER SERVICE CARD

CIRCLE 137 ON READER SERVICE CARD→

JUST OFF THE PRESS

NEW INGREDIENTS FOR NEW AND IMPROVED FOOD PRODUCTS



FLO-SWEET BLENDS ... a growing family of fine sweeteners

When only the right *combination* of characteristics will meet your requirements for a top quality sweetening agent . . . turn to Flo-Sweet. In the growing family of Flo-Sweet blends, you will find a rich variety of types and ratios from which to choose.

Doubly refined and united by a special comogenizing process for utmost uniformity, Flo-Sweet blends open up whole new fields for food manufacturers who are readying new table delicacies to tap tomorrow's rich and growing markets. To find out how these versatile sweetening agents can best fit into your own new food products development program, consult your Flo-Sweet Engineer. Or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

A FLO-SWEET BLEND FOR EVERY NEED!

These principal Flo-Sweet blends are comogenized at the refinery for complete uniformity:

SUCRODEX (*cane sucrose and dextrose*)
INVERDEX (*cane invert and dextrose*)
AMBERDEX (*amber sucrose and dextrose*)
SUCROSE/CSU (*sucrose and corn syrup*)

REFINED SYRUPS & SUGARS, INC.
YONKERS, NEW YORK

SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY
FROM YONKERS, ALLENTOWN, DETROIT, TOLEDO

FLO-SWEET®
FIRST IN LIQUID SUGAR

JUST OFF THE PRESS

PLANT ENGINEERING

Cushion Couplings. Details with tables and photos expanded line of Para-Flex units, in fractional to 190 hp./100 rpm. range. 12p.—Dodge Corp., Mishawaka, Wis. (418)

Level Controls. Details and illustrates AccuRay tank and bin, externally mounted units. 8p.—Industrial Nucleonics Corp., Columbus, Ohio. (419)

Speed Drives. Contains illustrations and specifications on adjustable units with ranges to 8:1, available in 1-30 hp. 6p.—Louis Allis Co., Milwaukee. (420)

Solenoid Valves. Gives specs and tips on correct usage. 8p. — Valcor Engineering Corp., Kenilworth, N. J. (421)

Heat Exchangers. Describes power and process applications of new finned-tube models for air and gas. 4p.—Schutte & Koerting Co., Cornwells Heights, Pa. (422)

Turbine Pumps. Illustrates new line. Cap.: 150 gpm. 8p.—New York Air Brake Co., Aurora, Ill. (423)

Pipeline Strainers. Details new self-cleaning, bronze-bodied units. Sizes ¼-3 in. 2p.—Sarco Co., New York, N. Y. (424)

Control Valves. Describes adjustable cam, lever operated type. 2p.—Atlas Valve Co., Newark, N. J. (425)

Valves. Wall chart details recommended installation, operation, and maintenance.—Lunkenheimer, Cincinnati. (426)

Vari-Speed Drive. Details complete line of Reeves mechanical units. Includes features, specifications, speed-rating tables, pricing. 96p.—Reeves Pulley Div., Reliance Electric & Engineering Co., Columbus, Ind. (Request on company letterhead.)

Air-conditioning. Details uses and principles of refrigerating units, compressors, boosters. 34p.—Frick Co., Waynesboro, Pa. (428)

Plastic Doors. Describes lightweight, walk-in cold storage and refrigerator doors. 4p.—Jamison Cold Storage Door Co., Hagerstown, Md. (429)

Metering Pumps. Gives specs for new heavy duty models. 12p.—Wallace & Tiernan, Belleville, N. J. (430)

Counters. Illustrates predetermining feature of major types. 4p. — Veeder-Root, Hartford, Conn., (431)

Feedwater Heaters. Discusses operation of internal vent condensers both vertical and horizontal in capacities of 3,000-300,000 lb./hr. 2p.—Stickle Steam Specialties Co., Indianapolis, Indiana. (432)

Continuous Blowoff Systems. Details possible savings in labor and operating costs, discusses various types. — Cochrane Corp., Philadelphia. (433)

Dust Collector. Details large-size unit for ultra-high efficiency product recovery. 4p.—Dustex Corp., Buffalo, N. Y. (434)

Motion Indicator. Details general purpose and explosion-proof safety mechanisms for conveyors, feeders, etc. Explains electrical-impulse alarm principle. 4p.—Bin-Dicator Co., Detroit. (435)

PROCESSING

Colloid Mills. Describes units from 1-125 hp. 8p.—Chemicolloid Lab, Garden City Park, N. Y. (436)

Purifier. Illustrates features of twin-deck model. 6p.—Allis-Chalmers, Milwaukee. (437)

Pelleting. Tells what to look for in mill, and discusses cooling, drying, crumbling, cleaning, and grading of product. 16p.—Sprout, Waldron, Muncy, Pa. (438)

Impact Mill. Specifications on new centrifugal type. 4p.—Safety Industries, Inc., New Haven, Conn. (439)

Balance Tank. Details advanced design unit for HTST system.—De Laval Separator Co., Poughkeepsie, N. Y. (440)

Impact Mill. Illustrates new whirling-blade, vertical-flow granulator with 360 degree screen. 4p.—F. J. Stokes Corp., Philadelphia. (441)

Mixers. Describes line of ribbon, mass and paste units. 12p.—Paul O. Abbe, Inc., Little Falls, N. J. (442)

Dryers. Details conveyor and spray equipment. 4p.—Proctor & Schwartz, Philadelphia. (443)

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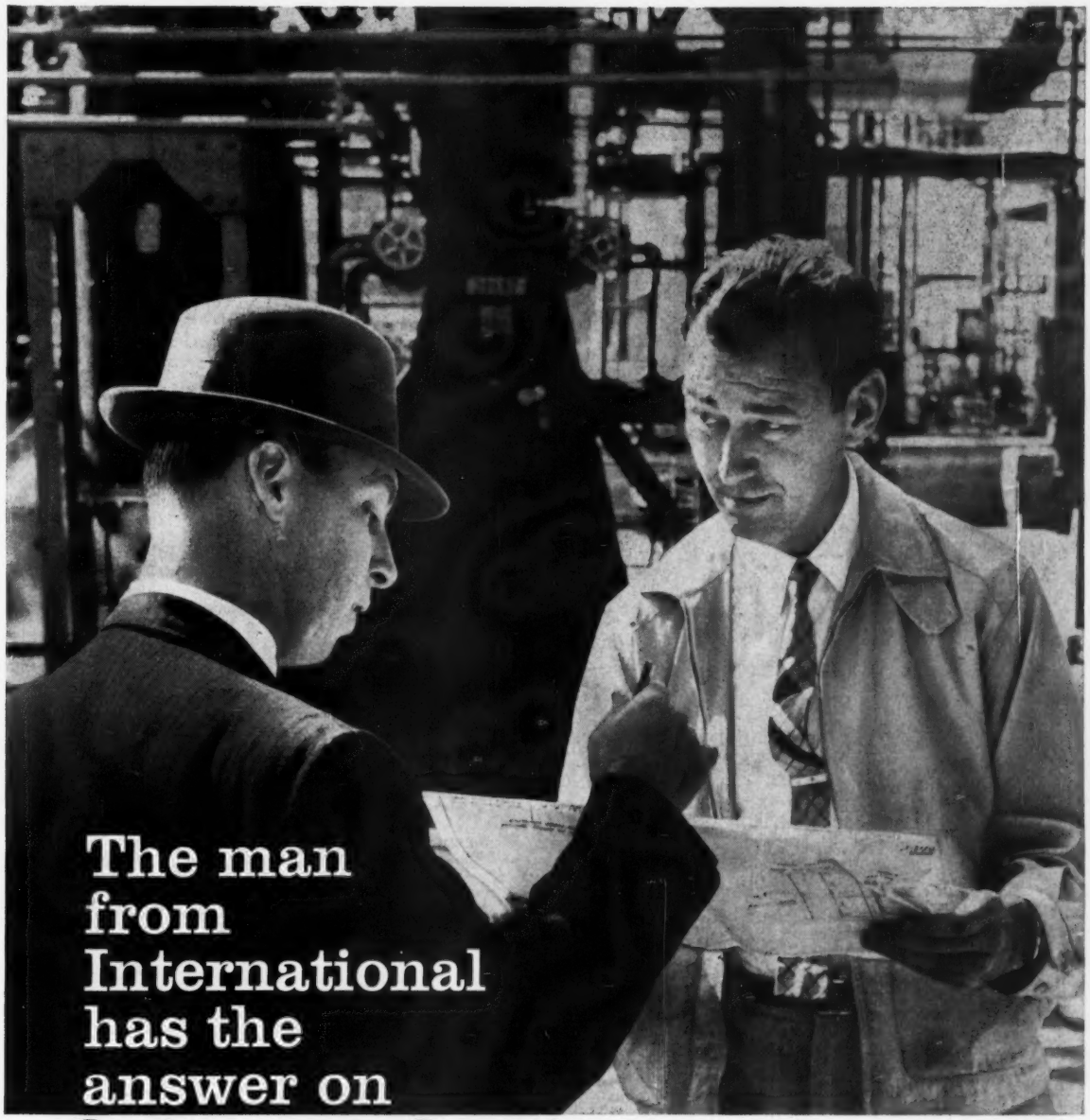

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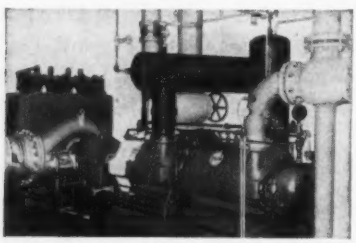

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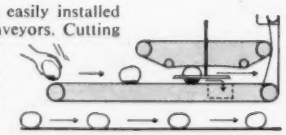

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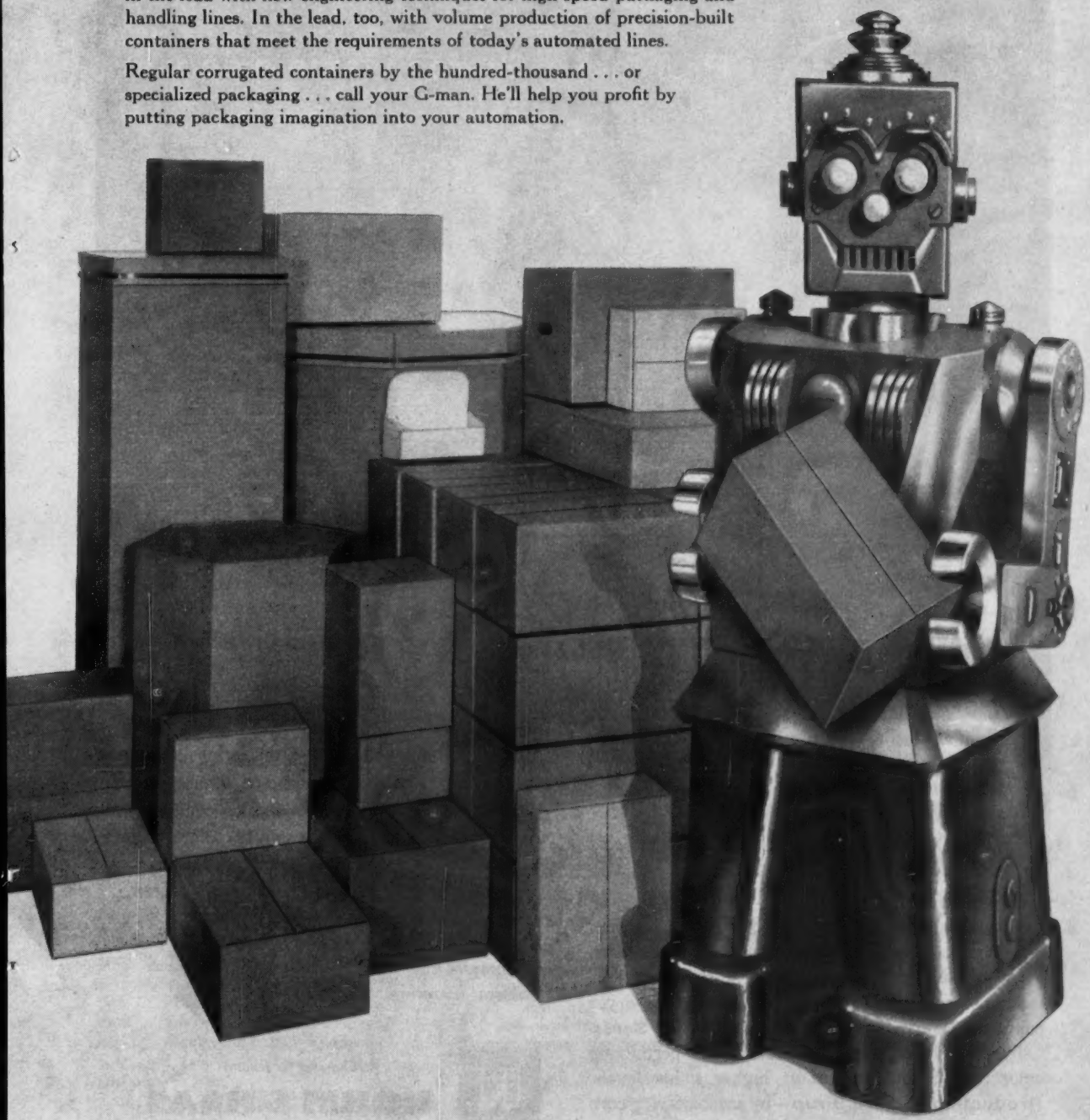

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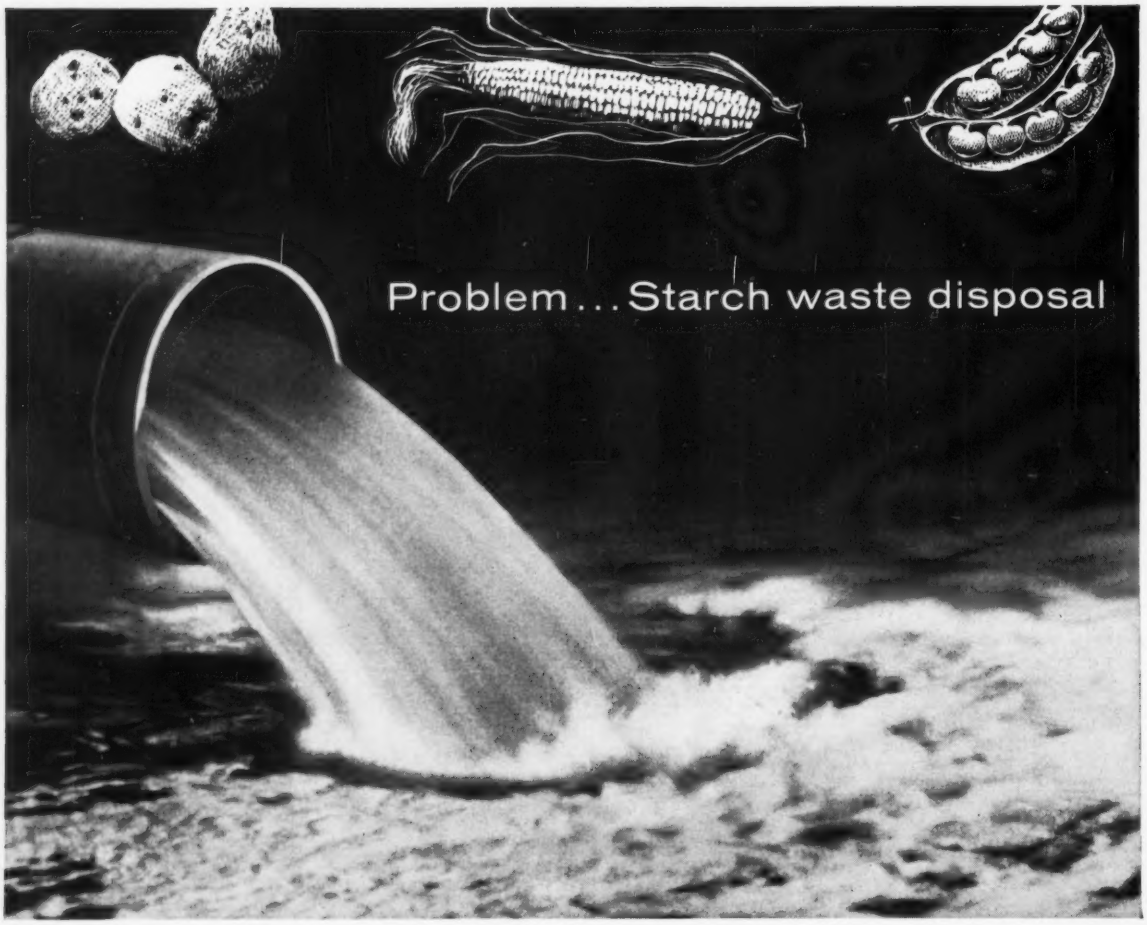

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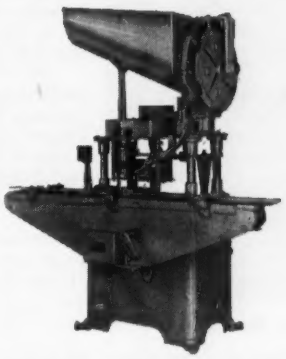

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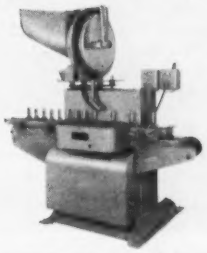

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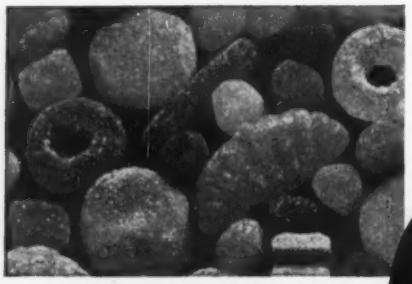

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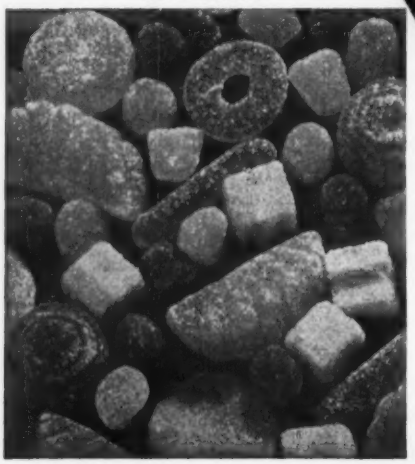

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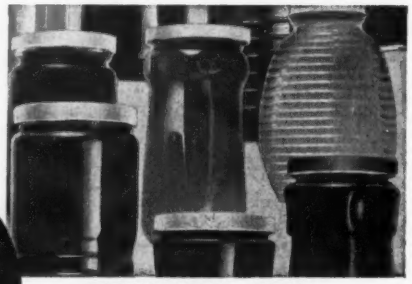

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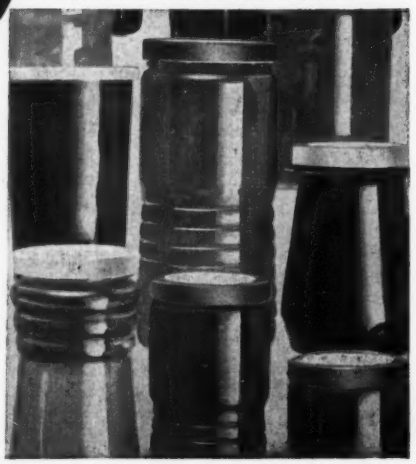

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Fruit Peeler With Rotary Cutting Blade.—John Boyce, Food Machinery & Chemical Corp., San Jose, California. No. 2,891,591.

Former for Shaping Raised Dough Into Bread Sticks.—Umberto Cassale, Voghera, Italy. No. 2,892,422.

Inserter for Placing Sticks in Confections in Conveyed Molds.—R. T. Glass, Austin, Tex. No. 2,892,423.

Machine for Deboning Hams. —R. T. Massengill, Chicago. No. 2,893,051.

Unit for Weighing and Shaping Cheese Into Balls.—A. A. Mongiello, Brooklyn, N.Y. No. 2,893,121.

Rotating Liquids-Solids Blender.—J. J. Fischer, Patterson-Kelley Co., Inc., E. Stroudsburg, Pa. No. 2,890,027.

Continuous Retorter Having Rotating Drum Mounted on Water Tank and Means for Carrying Sealed Cans Through Unit.—A. C. Richardson, California Packing Corp., San Francisco, Calif. No. 2,894,446.

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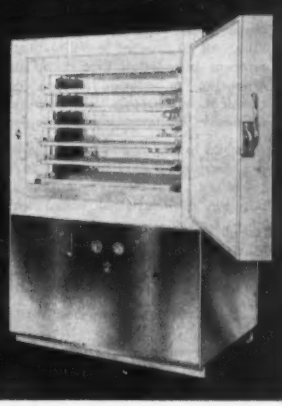

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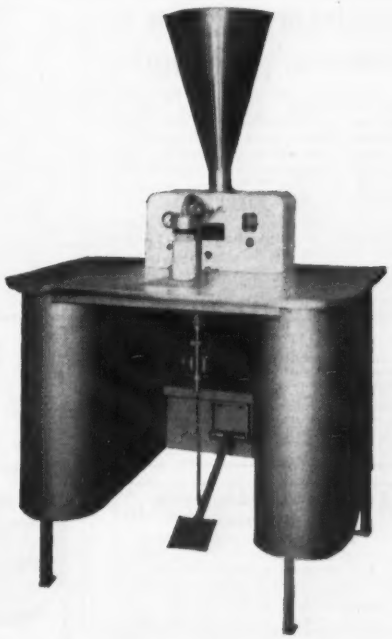

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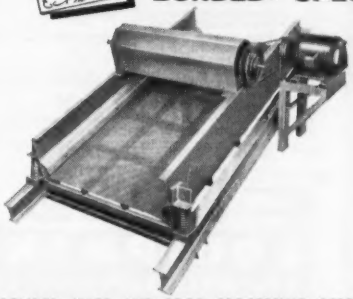

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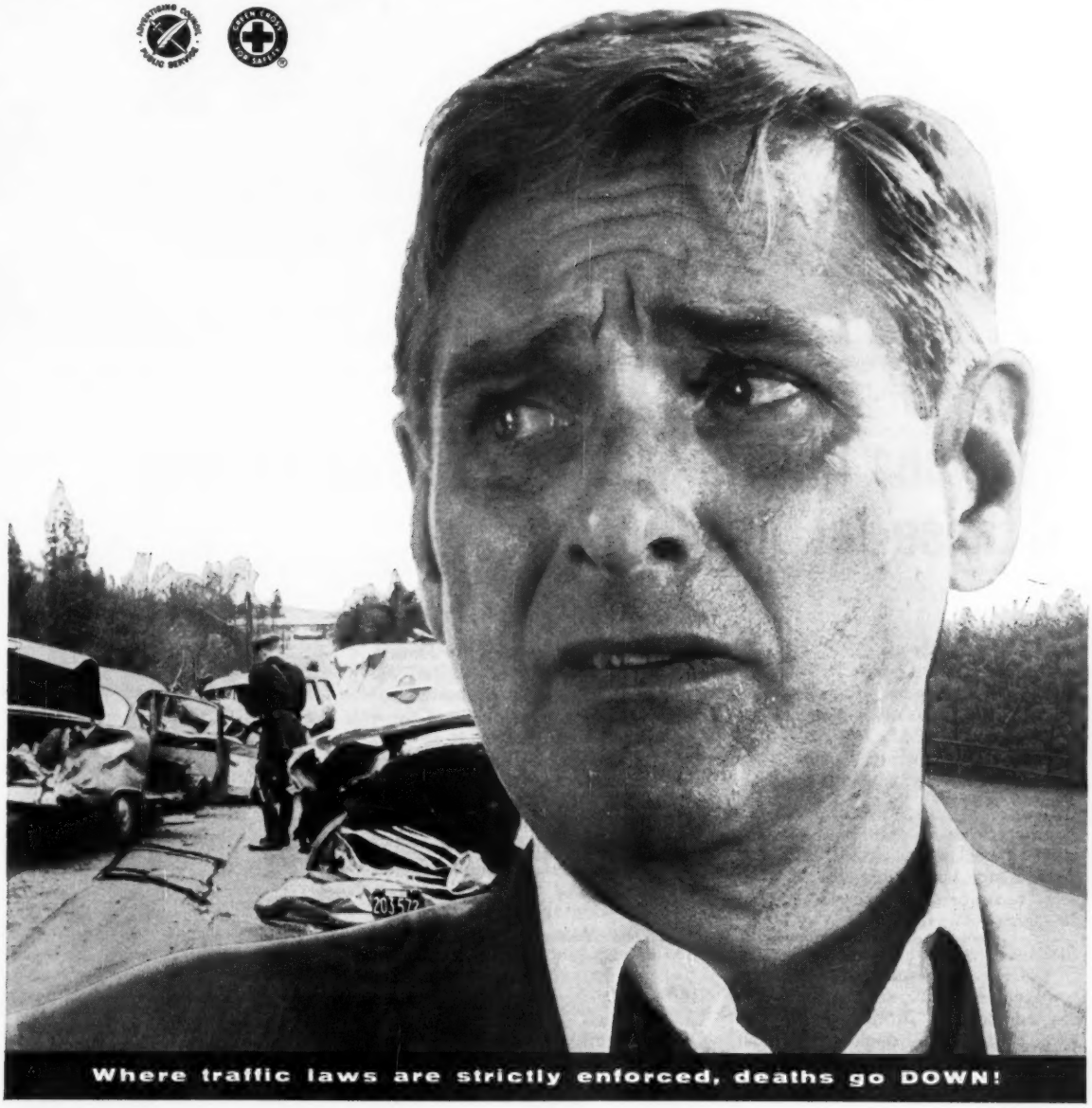

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ADVERTISERS LITERATURE				520	521	523	524	525	526	527	528	529	530	531	532	533	534	535	536	
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718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	

*MULTIPLE ITEMS *Key No..... Item..... *Key No..... Item..... *Key No..... Item.....

REPRINTS: Key No..... Quantity..... Key No..... Quantity..... ANNUAL FE INDEX Quantity.....

CIRCLE KEY NUMBERS, FILL IN REVERSE SIDE, MAIL

FEBRUARY 1960

Expires May, 1960

ADVERTISEMENTS				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17*
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NEW PACKAGES & PRODUCTS				402	403	404	405	406	407	408	409	410	411	412	413	414	415	416		
JUST OFF PRESS			418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435
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ADVERTISERS LITERATURE				520	521	523	524	525	526	527	528	529	530	531	532	533	534	535	536	
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SEARCHLIGHT				700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717
718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	

*MULTIPLE ITEMS *Key No..... Item..... *Key No..... Item..... *Key No..... Item.....

REPRINTS: Key No..... Quantity..... Key No..... Quantity..... ANNUAL FE INDEX Quantity.....

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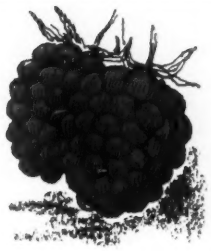

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